DOCUMENT RESUME

ED 285 705 RC 016 345

AUTHOR	Blackadar, Ann Riley; Nachtigal, Paul
TITLE	Cotopaxi/Westcliffe Follow Through Project. Final Evaluation Report.
INSTITUTION	Mid-Continent Regional Educational Lab., Aurora, CO.
PUB DATE	30 Jun 86
NOTE	160p.
PUB TYPE	Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)
EDRS PRICE	MF01/PC07 Plus Postage.
DESCRIPTORS	*Academic Achievement; Change Agents; Change Strategies; Elementary Secondary Education; *Inservice Education; *Intervention; Program Descriptions; Program Evaluation; *Rural Education; Small Schools; Staff Development; *Student Improvement; Teacher Attitudes; Time Factors (Learning); Time Management; *Time on Task
IDENTIFIERS	Colorado; Effective Schools Research; Four Day School Week

ABSTRACT

One of four programs funded nationally to test the notion that increased efficiency in the use of student and teacher time would result in higher student achievement, the Cotopaxi/Westcliffe Project was unique in that the two Colorado districts involved were small, rural, and operated on a four-day school week. The 4-year intervention consisted of full day, monthly staff development sessions for both teachers and administrator. Content was drawn from effective schools research and conventional wisdom about educational practice and was intended to improve student achievement by providing inservice to their teachers. Peer observations and teacher support groups facilitated the change process. A research component was in place throughout the project to monitor "time-on-task/engagement rates" and student achievement. Baseline data indicated quite high engagement rates during the life of the project. Achievement scores did not reflect this same degree of increase. This final report presents: (1) a complete description of the project context; (2) content and process of the training provided; (3) effects of the inservice on teachers' behaviors and attitudes; and (4) changes in student engagement rate and achievement. Recommendations for other small rural school districts are offered on the basis of this effort. A technical appendix contains copies of the instruments used to collect data for the evaluation. (Author/NEC)

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COTOPAXI/WESTCLIFFE FOLLOW THROUGH PROJECT

FINAL EVALUATION REPORT

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ABSTRACT

The Cotopaxi/Westcliffe Follow Through Research Project was one of four programs funded nationally designed to test the notion that increased efficiency in the use of student and teacher time would result in higher student achievement. The Cotopaxi/Westcliffe Project was unique in that the two districts involved were small, rural and operate on a four-day school week.

The four-year intervention consisted of full day, monthly, staff development sessions for both teachers and administrators, held on Friday, the "fifth day" when school was not in session. The content of this staff development was drawn from effective schools research and from the best of conventional wisdom about educational practice. Peer observations and teacher support groups facilitated the change process. A research component was in place throughout the life of the Project to monitor "time-on-task/engagement rates" and student achievement.

Baseline data indicated that engagement rates were quite high at the beginning of the Project. Increases in engagement rates during the life of the Project were statistically significant. Achievement scores did not reflect this same degree of increase.

INTRODUCTION

This is the final report of a four year Follow-Through Project involving the school districts of Cotopaxi & Westcliffe, Colorado. This project was intended to improve student achievement by providing inservice to their teachers. An underlying assumption of this project was that this direct service to teachers would be translated into changes in student behavior. This layered pattern of impact is illustrated in Figure 1. The evaluation of this program examined each level to determine the impact. Change had to be demonstrated at each level before change at levels more distant from treatment could be attributed to the treatment.

Figure 1

Layered Pattern of Impact of Follow-Through Projects

Level I - **Change in knowledge of teachers and administrators**

The provision of information to teachers and administrators improves the knowledge they have about how children learn, what they need to learn, and effective instruction practices. The creation of climate in which change can occur facilitates the application of this new information.

Level II - **Change in behaviors of teachers and administrators**

The application of the new information in the teacher's classrooms and in the administrators' activities will result in changes in use of time, in use of instructional techniques, in the support and collegiality of the teachers for each other and in the atmosphere of the schools generally.

Level III - **Change in behaviors of students**

The improved techniques used by teachers in their classrooms will result in fewer discipline problems, higher engagement rates, higher success rates, better motivation and lower absentee rates.

Level IV - **Improvement in achievement test scores**

Assuming a good match exists between what is taught in the classroom and what is tested, the achievement test scores will improve.

The report is organized in the following way. First a complete description of the project context is presented. It is our intention that readers will be able to determine the generalizability of the project's results by comparing their situation to the context in which this project took place.

Second, a description of the training which was provided is included. Both the content and process which were presented are described. In the third chapter, the effects of the inservice on teachers' behaviors and attitudes are discussed. The fourth chapter contains a report of the changes in student engagement rate and achievement. A technical appendix is included which contains a discussion of the instruments used to collect data for the evaluation.

Each section of the report is intended to be independent of the other sections, although all the sections are required to obtain a comprehensive understanding of the project. Some information is presented more than once and will seem redundant to those readers who read the entire evaluation. When possible, readers are referred to appropriate sections of the project for more detailed information.

CHAPTER I

IN THE BEGINNING

INTRODUCTION

In July of 1981, the Cotopaxi/Westcliffe Follow Through Project was one of four contracts negotiated with the National Institute of Education to explore the viability of improving student achievement in mathematics and reading, primarily by increasing the efficient use of student and teacher instructional time (time-on-task/engagement rate). The other three projects involved the school districts of Detroit, Oakland and Napa Valley. The four year contract called for the development of an intervention strategy for bringing about these increased time efficiencies and a research design capable of tracking the impact of the intervention.

The Cotopaxi/Westcliffe Follow Through Project was unique in a number of different ways.

1. It was the only project to involve small rural schools.
2. The two participating schools operate on a four-day school week, an option provided by the state of Colorado to help districts cope with energy costs and budget restrictions.
3. The Project was a collaborative effort involving two school districts, an institution of higher education and a regional educational laboratory.

THE CREATION

The initiative to compete for the Follow Through contract originated with the Mid-continent Regional Educational Laboratory, (McREL). The RFP was attractive for two reasons. First, it specified that it wanted to target a rural school population as one of the programs to be funded. The Laboratory had an ongoing Rural Education Project with a mission to address the unique problems of small rural schools. Secondly, the purpose of the RFP, the raising of student achievement through the more efficient use of time, dovetailed nicely with another of McREL's program components designed to translate the emerging "effective schools" research into a school improvement program. Furthermore, Colorado had just recently changed the definition of the school year which allowed schools to operate on a four-day school week. If it was possible to find interested schools that were on the four-day school week, it might just be the added dimension to catch the interest of those making the funding decisions. Getting this interest and commitment at the local district level was also necessary to meet the RFP requirements that the contracting agency be a local education agency.

Knowing that small rural school districts have neither the expertise nor the time to develop competitive proposals, the Director of McREL's Rural Education Project visited with staff from Colorado State University who had been conducting a study of districts implementing the four-day school week. If a couple of these schools could be persuaded to participate in the Follow Through program, the study could serve a dual purpose. Because of the extensive data collection which would be required to monitor effective use of time, a proposal could be written that would not only address the "more efficient use of time increased/student achievement" issue, but could enlighten some questions concerning the viability of the four-day week as well. One such issue, for instance, was concerned with whether or not early elementary students, K-4, could learn as well in a four-day week with its 20% longer school day as they do in the traditional five-day week. The CSU staff agreed that there were some possibilities worth pursuing and arranged a meeting with the superintendents of the two neighboring schools of Cotopaxi and Westcliffe.

At this meeting, the content of the RFP was discussed along with the possibility of developing a collaborative effort involving the two districts, Colorado State University and McREL. Since the RFP required two sets of K-4 classrooms, both districts would need to be involved. Furthermore, one of the districts would need to serve as the contracting agency with the superintendent being designated as "principal investigator." The superintendents agreed to discuss the possible participation of their districts with their school boards and, in so far as possible, get reactions from those teachers that would be involved. School had been dismissed for the year and many of the teachers were gone for the summer.

Staff members from Colorado State University indicated an interest in assisting with the delivery of the necessary staff development if the project was funded. McREL agreed to develop the proposal and, if successful in the competition, conduct the research component.

The contract was successfully negotiated and the consortium involving the two school districts, the University and the Laboratory continued for the duration of the Project. The arrangement had both its strengths and weaknesses as will be discussed later in the report.

THE SETTING

The neighboring school districts of Cotopaxi (Fremont County RE 1) and Westcliffe (Custer County C-1) lie along the east slope of the Sangre de Cristo Mountains in South-central Colorado. The Cotopaxi District covers 540 square miles dominated by the Rio Grande River and the mainline of the Rio Grande Railroad. The business district, clustered along Highway 50, consists of a general store, filling station, a cafe and a small pottery business. The river rafting expeditions, which begin in the lower end of the district at Texas Creek, represent a major tourist attraction.

The Cotopaxi Schools sit on a man-made bluff carved out of the mountains on the north side of town. The buildings are a mix of an old two story building, constructed in the early 30's, and newer classroom wings for the elementary grades and the specialized facilities required at the secondary level. The majority of the teachers commute from their homes in the larger neighboring communities some 45 minutes away. Ninety-four percent of the 243 students are bused.

Twenty-six miles to the south, via a winding road that connects the Rio Grande Valley with the Wet River Valley is the town of Westcliffe. Because of its location, Westcliffe is much more of a self-contained community, providing a good variety of services for a town of approximately 400. Ranching is still the mainstay of the economy, supplemented by a number of summer camp operations along the Front Range to the east and a developing ski area to the west.

The Westcliffe schools are of more recent vintage, being of one design, with the elementary classrooms on one side and the secondary on the other. Separating the two are the administrative offices and the gymnasium. The teachers live in the community or in the surrounding area. The 700 square mile district enrolled 393 students K-12 when the project began, 60% of whom were bused.

Both of the elementary schools participating in the project would be considered to be traditional, e.g. self-contained classrooms, one teacher per grade level, with relatively small classes. Administrators and support personnel such as principals and counselors are responsible for the entire K-12 system in each of the two districts. In Cotopaxi, 53% of the students participated in the free or reduced price lunch program; in Westcliffe, 33% of students participated with another 17% eligible. Both schools qualify for Title I; Cotopaxi has a 3.6% minority population (i.e., 8 students), Westcliffe, 6.1% (18 students). The school is the largest employer in both communities where the average income is $10,000 per family.

When the Project began, Cotopaxi's reading scores on the Iowa Test of Basic Skills indicated 66% at or above the norm; 44% of the K-4 students were at or above norm in mathematics. Test scores were not available for all grades in Westcliffe, however, information available for grades 3 and 4 on the Iowa Test of Basic Skills indicated norms approximately one year above grade level in both reading and math.

THE FOLLOW THROUGH PROJECT: AN OVERVIEW

The general parameters of the Cotopaxi/Westcliffe Follow Through Project were consistent with those laid out in the RFP. All students in grades K-4 in the two schools would be involved. The emphasis was to be on increasing achievement in reading and mathematics through the more efficient use of student and teacher time. A research component would be developed to monitor the changes in the use of time (engagement rates), and any impact on student achievement.

The proposed intervention to increase engagement rates was a series of full day workshops (approximately one each month during the school year for the life of the project) to be held on Friday, the "5th day" when school was not in session. The schools would alternate hosting the sessions. Consultants from Colorado State University and McREL, provided by the Project, would be responsible for assisting in the planning and delivery of the staff development activities. The Project would also pay the participating teachers and administrators an extra day's salary for attending the in-service sessions since they put in the equivalent of a regular week's work in four days with the alternative schedule's, 20% longer school day.

The general routine called for the consultants to travel to the site on Thursday morning, approximately a four hour drive, visit/work with teachers and or administrators in their buildings on Thursday afternoon. Teachers and administrators would then both participate in the day-long work session on Friday. Staff members were left with tasks or practices to work on during the month. During the next session, the successes and problems encountered during the month would be discussed prior to moving on to new activities. The cycle would then be repeated.

GETTING STARTED

During preliminary planning sessions, concerning how best to get the Project underway, the decision was made to focus on the reading and math curriculum. Neither of the schools had engaged in any recent curriculum work nor did they have written curriculum guides. It was argued, that if increasing engagement rates was to have any impact on student achievement, the curriculum needed to be sufficiently coherent so that if mastered, it would result in higher achievement. A series of Friday work sessions were devoted to structured "curriculum mapping" activities to insure that content was being covered in a sequential and articulate fashion.

During the months that the curriculum work was taking place, classroom observers were being trained and the baseline data collected on engagement rates. Since one of the important questions to be investigated by the Project was the ability of the students to make good use of the 20% longer school day, observations were made and data collected for the full day, not just during reading and mathematics. An analysis of the baseline data indicated relatively high engagement rates, 82.53% in math and 81.03% in reading.

PROJECT PLANNING

During the life of the Cotopaxi/Westcliffe Follow Through Project the planning process was characterized by parallel activities at two levels. One level was concerned with the longer range planning of Project activities. These sessions always involved the superintendents and the consultants, and depending on the issues and time availability, the principals and teachers as well. (A number of such planning sessions are of note and are discussed below.) The second level of planning tended to be ongoing and was concerned more with the fine tuning of Project activities. The last portion of each inservice day involved the participants in an informal evaluation activity, the results of which were discussed by the consultants on the drive back to Denver and used to help shape the next inservice session.

MAJOR PLANNING SESSIONS

The first major planning session, once the Project was underway, took place when the participants were presented with baseline data on engagement rates and achievement scores in reading and mathematics. The engagement rates appeared to everyone to be quite high and no one was particularly concerned about the level of student achievement. A lengthy discussion followed concerning whether or not the Project should pursue a narrow, sharply focused effort to attempt to drive engagement rates even higher, or develop a more balanced set of activities which would expand the teacher's repertoire of instructional strategies, always keeping in mind the bottom line of the Project, e.g. how do these strategies contribute to or stand in the way of more effective use of student and teacher time.

A persuasive case was eventually made for the latter option, based on the fact that the curriculum and instruction in small rural schools is typically quite limited, and fairly basic. It was agreed that finding ways to enrich the learning environment might be as important to the improvement of student achievement as increasing the efficiency of that learning environment. As a result, the Project attempted to put together a parallel, but integrated, staff development program which included various models of teacher and "effective schools" practice.

A related set of issues concerned with staffing the inservice also came under discussion during the same meeting. The original plan had called for using a variety of different consultants, drawing both on the resources of Colorado State University and McREL. Feedback from the teachers and administrators suggested that it would be better to find two trainers that could address the broader focus discussed above (effective schools practices and expanding the repertoire of teaching strategies), and stay with those individuals, thus providing consistency and building the trust that results from an ongoing relationship.

The planning session at the end of the second year of the Project was facilitated by a computer driven decision making process which allowed all staff members to be involved in establishing program priorities for the following year's activities. A two day planning retreat was held prior to the last year's activities for the district administrators, consultants and teacher representatives to reflect on activities to date, review the proposal to see if the Project was doing everything it said it would do and structure the final year's program.

PROGRAM COSTS

The total cost of the four year Cotopaxi/Westcliffe Follow Through Project was just under $240,000, or approximately $60,000 per year. Of the $240,000, approximately two-thirds of the costs were related to the research, reporting, and administrative requirements of the RFP which included periodic travel to Washington, D.C. Approximately $80,000, or $20,000, per year was spent for the actual staff development interventions to improve the effective use of time.

In developing the Project, careful consideration was given to designing a project which would not be so expensive that other districts could not consider implementing a similar effort. Cost considerations contributed significantly to the decision to go with part-time personnel from the University and the Lab to carry out the various functions rather than hiring full-time personnel. Lab personnel were contracted on a daily rate to develop and conduct the research component and, for all practical purposes, carry out the duties of the principal investigator. Staff members from Colorado State University were contracted for in the same way for staff development work.

The $20,000 per year costs for a comparable staff development program, e.g. two consultants for two days/month during the school term, plus paying the teachers and administrators for the extra day would not be out of reason, particularly if two or more districts joined together in a cooperative effort. An analysis of the cost savings realized in moving from a 5 to 4-day school week are sufficient to cover the costs of such a school improvement program. As we shall show later in the project results, elementary students appear not to be adversely affected by the 4-day school week. This in effect, then, gives local board members a choice of using the education dollar to bus students 5 days a week, or go to a 4-day schedule and invest that money in instructional improvement.

PERSONNEL CHANGES DURING THE LIFE OF THE PROJECT

Conceptualizing a field based research project is one thing. How things actually get played out over time is generally something quite different. A number of personnel changes took place, both in the schools and in the part-time project staff, which impacted on the operation of the project. These will be discussed as a way of providing additional background and understanding before moving on to Project outcomes and lessons learned.

While maintaining job tenure may or may not be any more difficult in small schools than in large schools, changes in staff tend to have a greater impact in small schools simply because there are so few of them and the relationships tend to be much more personal than in the large school setting. The superintendent as well as the principal, for instance, work directly with the classroom teachers. When a third grade teacher leaves, the whole third grade staff turns over. There is not the bureaucratic inertia which comes from numbers to keep programs in place.

The Cotopaxi/Westcliffe Project experienced a number of staff changes during the four years, some of which had more impact than others. At the end of the first year of the project the Cotopaxi superintendent, who had been designated principal investigator, resigned. In so far as can be determined, the problems with the board, which precipitated the resignation, had nothing to do with the Project. According to the superintendent, there were personality differences with members of the board and a disagreement on how best to deal with re-sodding the football field. The end result, however, was the need to designate a new principal investigator and negotiate these changes with NIE. Rather than leaving these duties, which primarily involved overseeing the financial aspects of the Project, with a new superintendent, the decision was made to move this responsibility to the superintendent in Westcliffe.

The principal of Cotopaxi, who had been a part of the Project from the beginning, was appointed superintendent which helped to provide continuity in the project. The person filling the principalship was new to the system and had to be oriented to the project activities. These were the only staff changes that took place in Cotopaxi.

The Westcliffe situation remained stable until the fourth year of the project. While one new teacher was brought in during the second year of the project because of large enrollments at the first grade, there were no resignations until just prior to the final year. At that point, the principal, who had become one of the strongest leaders in the program, left for another principalship; his wife, one of the project teachers, went with him. Two other teachers also resigned, one to join her husband in another location; the other to take an assignment in another state. Losing 4 out of a staff of 7, with one being the principal, left a sizeable hole in the program. In order to bring the new staff along as quickly as possible one of the strong teacher-leaders was released part time to serve as a resource person. There was, however, a significant loss of momentum because of these changes and no doubt some deterioration in overall project impact.

There were also some important changes with the support personnel at McREL which impacted the program. The person responsible for developing the original research design left the Laboratory before the contract was negotiated. His replacement at the lab rewrote the design which was incorporated in the program, but because of other interests, never invested the necessary time to see that the program was well implemented. It finally took the interest and skills of a research assistant to get the research component on track. And, while all these difficulties did not greatly impact the overall effectiveness of the research component, e.g. the necessary data was collected as well as possible with the existing state-of-the-art, and analyzed for project impact. It did not however, function in such a way as to provide the periodic feedback to teachers and administrators which had been hoped for and which may have contributed to the overall effectiveness of the staff development effort.

CHAPTER II

WHAT REALLY HAPPENED: A TRAINER'S PERSPECTIVE

INTRODUCTION

As mentioned in Chapter I, the project as conceptualized and the project as conducted are two different entities. The treatment in this project consisted of inservice provided to teachers and included an eclectic, sometimes seemingly incompatible, collection of techniques, procedures, and methods. The inclusion of these diverse technologies was a deliberate training decision. The outcomes of the project are best understood in light of the training which was provided. This chapter contains a description of the content and the training process.

CONTENT OF THE STAFF TRAINING

The staff development intervention was, as indicated earlier, shaped in part by the participants themselves. The guiding rationale was: "What works and how can it be presented and applied in an effective and affordable manner?" Efforts were made to ground the activities in recent research or the best of conventional wisdom about good practice. The substance of the inservice was drawn from a number of sources. The first source was the "effective schools research", e.g. effective use of time/increased engagement rates, creating an orderly climate for learning, developing strong leadership, high expectations for students, focus on the basics. (reading and mathematics), careful monitoring and feedback of student progress. The time issues were addressed in two ways. The curriculum mapping detailed the amount of time each project teacher spent on reading and math on a regular basis. To increase engagement rates, teachers were exposed to a variety of ideas and techniques intended to reduce classroom disruptions, to decrease the time needed for transitions from one activity to another and in general to improve the climate for learning.

A second source for the inservice training was the instructional paradigm popularized by John Carroll and Benjamin Bloom known as mastery learning. Teachers were trained to (1) perform task analysis, (2) break the curriculum into small steps, (3) carefully sequence instruction and establish clear criteria for mastery, and (4) develop corrective or remedial activities for those needing more assistance as well as extension or enrichment activities for those already demonstrating successful mastery.

A third dimension of the training program was based on the developmental notions of Piaget and Bruner. Teachers were assisted in assessing the cognitive levels at which students were functioning, and how to better challenge them actively in the learning process, thus stimulating their cognitive growth. The final dimension of the substance of the training program was to broaden the variety of instructional approaches available in the classroom. Cooperative learning and peer tutoring were introduced to increase the involvement of students in the learning process, provide active assistance and more immediate feedback for each other. Concept attainment, inductive thinking, inquiry learning, synectics, a technique for fostering creativity, and story telling were introduced to increase both the activity level of students and the quality of their engagement in learning.

The introduction of challenging student-centered instruction created more group and interactive experience, more focus on problem solving, more opportunities for the teachers to play active roles as facilitators for learning. The decisions to include such activities were made consciously, recognizing that by so doing the high engagement rates, attributed to a generally orderly climate and the extensive use of seatwork, might be put at risk, at least temporarily.

STAFF TRAINING PROCESS

From the Project's very beginning, attention to the process of training was given consideration equal to that of the products or content of training. The full day, monthly inservice sessions appeared to meet the findings of the 1978 Rand study regarding the need to provide adequate time and follow-up for innovations to be successfully adapted and adopted locally. In addition, staff members from the two project schools were actively involved in the planning for and delivery of training. One time appearances by outside experts were avoided. Other teachers were utilized to demonstrate successful techniques both via videotape and directly in the project school classrooms.

A peer coaching model involving scheduled peer observations and regular support group meetings, based on the work of Joyce (1982), was introduced to provide an ongoing, practical and cost-effective vehicle for the implementation of new practice and solving the problems which emerge as the result of this implementation. Finally, careful attention was given to the general learning climate of the schools, Sarason (1980) and Lezotte, et al. (1980) as a way of fostering increased student learning.

In the following portion of this chapter, one trainer describes the training which was provided to meet two of the project objectives:

1. To create an environment in which "change" is fostered.

2. To improve classroom instruction through the use of research-based classroom practice.

CREATING A CHANGE ENVIRONMENT FOR IMPROVING CLASSROOM INSTRUCTION

Creating an environment for change was no accident with this project. A major portion of the resources, both time and money, was dedicated to this end. The model conceived for use in the Project was unique and thus bears close examination.

There is a specific set of assumptions underlying the creation of a change environment that were drawn upon in developing such a climate in the Westcliffe/Cotopaxi Project. Before we actually describe the model developed for use in the Project, it is important to understand these assumptions and their application in a school setting.

Assumption 1: We are motivated to change when we believe that a particular activity or practice will satisfy a need or desire we have. The emphasis here is on the need as identified and defined by the individual rather than the need expressed by a designated leader or group. It may be true, however, that as a result of a suggestion by another, we are able to see our individual need being met and, thus, will change. The decision to change, however, is still with the individual.

This is particularly germain to the school setting wherein the principal often is the person expected to make suggestions to a teacher for change in behavior. Often, however, the desired change does not occur as a result of these suggestions. If change does occur, it is often temporary and once accountability is relaxed it disappears. The reason is that the need is one seen by the administrator rather than by the individual expected to make the change—the teacher. Thus, an important concept to this particular change model is that the individual teacher is the person who is expected to identify the change and make the appropriate decisions with respect to modified actions.

Assumption 2: Feedback is necessary for change to occur. Feedback has two functions. It provides a starting point for change and it allows for adjustments in behavior to meet the desired outcomes as the process of change takes place. This feedback is required by both the individual and by a "group" for behavior to change.

Feedback in many schools simply means a periodic observation and review (or no review at all) of a teacher's performance. "Periodic" might be defined from "once" to perhaps a maximum of three or four times a year. This is usually done by the principal or his/her designee. This type of feedback does not meet the conditions required for change in teacher behavior to occur. First, the "starting point" for the change is often too late in coming. Second, behavior can hardly be adjusted when feedback is provided so infrequently.

Assumption 3: Support is an essential element of change. The more support we receive from others for our actions, the more likely it is that those actions will continue and strengthen. This concept has been proven many times with such movements as Weight Watchers, Smoke Enders, AA and the like. The support must be consistently present over time in order to make a difference and be provided by others who are able to empathize because of similar needs or experience.

Assumption 4: The primary "experts" in classroom instruction within a school are the professional staff, 95 percent of whom are classroom teachers. Thus, the experts are the teachers. An adjunct to this assumption is that, generally speaking, teachers believe each other in terms of instruction more than they do other roles in the educational setting, i.e., principal, professor, central office personnel, etc.

Assumption 5: There is a known body of characteristics that the research tells us are more effective than others in increasing student achievement and performance; certain specific classroom practices work better than others. The existence of these practices can be observed in the classroom and, further, these practices can be learned by teachers and implemented in their classrooms.

This body of research-based teaching characteristics provides the basis for the improvement efforts in the school. While the "change environment" is the "process" vehicle for improvement in the school, these research-based practices are the "content" for increased effectiveness.

Assumption 6: The primary educational leader in the school is the principal. There are specific leadership behaviors that work better than others in facilitating a program of instructional improvement.

These leadership behaviors can be assessed in each principal and a planned program of leadership development can be implemented to assist in the school's overall improvement efforts.

PEER-CENTERED COACHING MODEL: A VEHICLE FOR CLASSROOM CHANGE

The model utilized by the Project staff to implement change and thus improve instruction in the classrooms of the two schools came to be known as the Peer-Centered Coaching Model. It encompassed the following elements:

- motivation to change aimed at satisfying individual needs, as well as group identified needs;
- feedback for teacher and administrator behavior;
- focused support, teacher-to-teacher and group-to-teacher;
- drawing upon existing instructional "expertise";
- creating a new instructional expertise through sharing of research-based classroom practice;
- examining and improving leadership practices by the school administrators.

Many school programs suggest that some or all of these elements of improvement and change occur incidently (or in some cases, accidentally). The major difference with this NIE project is that ALL of these elements were present throughout the program and were, in fact, structured into a specific model from the beginning. The particular model of coaching developed for use in this Project was based upon work from a number of various researchers, practitioners and disciplines. We will now examine this model and its specific characteristics.

The Peer-Centered Model has two major components, namely: the use of "peer observations" and implementation of a support system. Both components are vital to the maximum success of the model as a vehicle for change and improvement. A description of each component follows based on the experience obtained with the staffs of the Project schools.

PEER OBSERVATION

The general guidelines for the "peer observation" were as follows:

1. Team up with somebody you like and/or respect. The process depends upon credibility and trust.
2. Maintain a non-judgmental, non-evaluative posture when giving and receiving feedback. Remember: We only make change when we are motivated by some need or desire WE have.
3. Use the opportunity to develop a "trust partner"—one with which you can feel free to brainstorm new ideas, challenge old ones, reveal frustrations and failures, as well as successes, and generally be more vulnerable than, perhaps, you feel you usually are able.
4. Expect support and encouragement from your principal. Seek his/her help in setting up your peer observation schedule. Avail yourself of his/her expertise, when appropriate. Remember: Your principal

> supports this program and has expressed his/her availability to help you to make it work.

The process began at the outset of the second year of the Project. At this point, many of the resource materials used to support the Coaching process were not developed. Further elaboration of the model and how it was implemented are described below:

> Teachers form groups of two or three. While the two-person team seems to work best, there may be situations where three teachers are able to more easily schedule their observations. This team will remain as a group for at least the first six to eight observations. After that, teachers may choose to team up for the Peer Observations on an ad hoc basis, dependent upon the specific practices to be observed, the availability of the observation partner, etc. Teachers often form their groups on the basis of similar grade levels or subject areas, but this is not necessary.

In one of the Project schools, an interesting phenomenon took place. A number of Project teachers actually tried teaming up with secondary teachers who are housed in the same building. The success of this approach was never examined in detail, but did seem to be satisfying for a few of the teachers. The essential ingredient in the Peer Observation process is the giving and receiving of specific feedback in a safe and trusting environment and thus the grade level expertise of the observer is not crucial to the process.

The two teachers then developed an observation schedule with the assistance of the principal. Because the Westcliffe and Cotopaxi school districts were quite small, the superintendents of each of the sites also were able to provide assistance. The length of time for each observation varied dependent upon the specific practices being observed. For example, a teacher may ask his/her peer observation team member to record how quickly the students in a particular Reading group begin to work on an assigned task when the teacher moves to a second group. This might require the observer's presence in the classroom for only a few minutes to observe that specific activity. In another instance, a teacher may want to find out if he or she is allowing opportunities for all students to answer teacher-directed questions. This may require an observer being present for a longer period of time. The length of time spent in the classroom by the observer varied considerably from classroom to classroom, as well as from school to school because of the procedures followed in each of the schools to "free up" teachers to do the observations.

In one of the schools, it became apparent from the beginning that teachers had very little non-assigned time to be available for such observations. While various plans were attempted such as the principal taking over classes, the use of parent volunteers and the like, the decision was finally made to pay a substitute teacher to come into the school one day per week, twice a month, for the express purpose of covering classes. This enabled teachers to be free to observe in a colleague's classroom. The principal also covered some of the classes, as well.

In the other school, the "coverage" for teachers observing was handled primarily through the use of "specialists" such as music and art teachers. The observations took place when classroom teachers were freed by the presence of these specialists in their classrooms. In addition, the principal, and in some instances, the superintendent covered classes. Some parent volunteers were also used.

The team members met prior to the actual observation to determine who would observe who, and specifically what practices were to be observed. The first observations were made with little or no focus on specific practices in order to allow the participants to become more comfortable with having another teacher in their room. Of course, it is the observation and feedback of specific classroom practices that is key to the growth and development of the teachers involved. As the training process continued, specific classroom practices associated with the instructional effectiveness research were presented by the inservice consultants at each of the subsequent Friday staff development days. These research-based practices, which are tied to increased student performance, in fact, provided the basic content for the peer observations.

In most instances, it was discovered that the optimum location for the observer is at the back of the room. This did vary, obviously, dependent upon the type of activity being observed. Other information, such as how long the observation should be, what type of lesson will be going on, etc. needs to be discussed in advance of the actual observation. A "Peer Observation Planning Sheet" (see Technical Appendix A) was developed and used for this purpose.

Following the observation, the two teachers met to share what was observed. This meeting usually took place immediately following the observation session. In a small school such as those involved in the Project, it was fairly easy to adjust the time required to do both the observation and the follow-up conference. Usually this meeting required very little time since it is essentially a feedback session. The average length of time for this session by the Project teachers was about ten minutes, although some teams used this "sharing" time for more in-depth discussion, which obviously required more time. The most important factor seemed to be that the meeting take place as soon as possible following the observation. A typical feedback session is as follows:

a. The observer objectively reports on what he/she observed, stating what was observed as specifically as possible, quantifying the behaviors, wherever applicable, i.e., "When you moved to the second Reading group, I observed that three of the eight students appeared to be on task within the first two minutes. The others in the group appeared to all be on task within the next minute with the exception of one student who really never seemed to get going on the assignment." or, "I noticed that when you asked the question about the causes of the Civil War, of the whole class, five students immediately raised their hands. You called on one of them just as ten or twelve other students began to respond."

b. The teacher then does a self-critique with respect to the specific behaviors that were reported by the observer. For example, "I might have remained with the first Reading group for a minute or two after giving instructions on the assignment instead of moving on so quickly to the second group" or, "What I think I will try next time I ask a question of the class is not to respond to volunteers, but rather call upon students at random. This will allow every student an equal opportunity to answer the question."

c. The two teachers share any experiences, ideas or techniques that might be tried to bring about the desired change. Again, NO judgments. Avoid "You should....Try saying, "I tried..." or, "I think this might work for ME in a similar situation."

THE SUPPORT GROUPS

The second component of the Peer-Centered Coaching Model is the formation and implementation of the Support Groups. Although both school staffs used the two components of the Coaching model throughout the duration of the Project—peer observations and support group—the Support Group meetings were considered the "most useful" by the members of both school staffs. This is partly understandable because of the "social" nature of such meetings. It is further evidenced, however, that this medium provided a real learning experience in terms of improving specific classroom practices.

The primary purpose of the Support Group in the context of the Peer-Centered Coaching Model is to provide a vehicle of support to help teachers as they continue to improve their instructional effectiveness. Essentially groups are comprised of teachers who have a common desire to improve their classroom effectiveness, as well as the desire to give and receive feedback. The Support Groups at both of the Project schools were comprised of four Peer Observation teams. For purposes of interactive discussion and participation, this appears to be the ideal number of group members. These groups were maintained as integral units throughout the first three years. During the final year of the Project, staff changes at one of the schools caused the original support group to totally reorganize itself. It was obvious when this occurred that the school which had retained its original group membership from the beginning of the program continued to operate smoothly during that final year. The Support Group in the other school, on the other hand, had to begin many of the support practices over again.

It was hoped that the Support Group would be viewed by the teachers as a useful vehicle for professional growth, rather than as another way to take up their time; to add to their already over-burdened schedules. To avoid "runaway" sessions and keep the meeting on task, certain specific roles were taken by various members of the Group during the support meeting.

A FACILITATOR conducts the business of the meeting. In fact, all of the group members assisted the process of the movement of the meeting by acting as facilitators for the group process. Part of the Peer-Centered Model training that took place on the Friday inservice sessions dealt directly with this skill of group facilitation. While in the beginning, various group members volunteered to take this role on a rotating basis, as the groups progressed one person emerged as the facilitator and maintained this role for a period of time.

The Facilitator was responsible for starting the meeting on time and ending the meeting on time, as well as keeping the meeting on task. The issues of staying on task and being "on time" are, perhaps, the two factors that contributed most to the breakdown of meetings. When an individual is concerned about what he/she "ought to be doing" instead of what is going on in the meeting, that person is not a contributing member of the group. The times of the meetings in the Project schools were not extended unless arrangements had been made prior to the meeting date.

The GROUP RECORDER was responsible for keeping a "group memory" of pertinent content of the meeting. Unlike the "minutes" in a traditional meeting, the group memory is taken on large sheets of newsprint and is recorded with a large marker or crayon so that all can view the "memory" as it is being written. The Group Recorder simply took notes of the important issues discussed at the meeting. When, during the course of a support group meeting, any Group member differed with what was being recorded, changes to the notes were made immediately so that all could see it can be changed. The newsprint "memory" was brought to each Group meeting and displayed for all to see. The Group determined norms for this "memory" during the course of the first few meetings. The amount of detail of this "memory" varied with the two groups.

As in the case of the Facilitator, the Group Recorder role rotated among the Group members in the beginning. As the process continued, one person emerged as the "Recorder." During the actual Support Group meeting, the Facilitator and the Group Recorder often switched roles when one or the other became so intensely involved with the discussion that he/she was not able to perform the respective role adequately.

The four basic phases of the Support Group meeting format are:

1. Development of the agenda
2. Review and feedback about the previous meeting.
3. Problem-solving
4. Closure

Each of these phases or steps in the Support Group process began to be clearly defined as the process progressed during the first year of the program. Each of the phases is described in terms of the specific process that emerged during that first year and continued to be used throughout the remainder of the Project duration.

DEVELOPMENT OF THE AGENDA. Once the meeting has been called to order, the Facilitator requests agenda items from the members of the Group. The items are usually in the form of some problem or issue being faced by the teacher in the classroom. Since the peer-centered Coaching Model's objective is "classroom instructional effectiveness," the issues discussed during the Support Group meeting tend to be classroom oriented. Usually the problem or issue is related to a technique or practice that a teacher has been trying to improve and perhaps has been the focus of observations with his/her Peer Observation team member. This "content" usually came as a result of a technique or practice which was presented as part of the training provided to teachers at a previous Friday training session.

The agenda item is stated in simple, behavioral terms. No elaboration is necessary at this time. The teacher providing the agenda item also estimates the amount of time he/she thinks will be required by the Group to "handle" the problem. For example, "I know that when I move from one Reading group to the second, the first group does not seem to get working on the assigned task immediately. I'm not sure what I might do so that they get started working right away. I think this will take about 15 minutes of the Group's time." Since most Support Group meetings are no longer than forty-five minutes in length, only one or two problems or issues will be handled. The purpose for requesting a certain amount of time is that this helps the Group to establish some Group norms around time. It is not expected that by stating an estimated time that this must be "held to" during discussion of that item. Again, rather, this is a way for the Group to begin to establish some norms for itself. The Group Recorder lists the possible agenda items as stated, in note form, with the amount of time requested and the person's name.

After all the items have been posted on the group memory, the Facilitator asks the Group to prioritize the proposed items to determine which items will be discussed at this meeting. In almost no case will there be enough time during a single meeting to discuss all of the agenda items. The purpose of the prioritizing session is to try to help the teachers who are most in need of help at this meeting. During the Friday inservice training sessions, the Project teachers practiced techniques for prioritizing and for determining who had the greatest need. Such techniques as "asking for what you want," using "I" statements, etc. were practiced in the training. For example, "I would like help from the Group during this meeting because I am meeting with the parents of this student to discuss this issue next week and so I need to get some help now!" It is important that even though an issue may not be handled by the Group because of lack of time or low priority, the person providing the issue was "heard." In many instances, members whose problems were not handled at the meeting found that other Group members offered their support and assistance following the meeting time. The process of agenda development allows each member an opportunity to ask for help from the group and to create an investment in the agenda items. The entire process, after practice, usually requires no more than five minutes. Items that are not handled by the Group during this meeting are not placed automatically on the next agenda. If the issue is still considered important by a member and wasn't handled at this meeting, the teacher must again go through the same process at the next meeting.

REVIEW AND FEEDBACK. The Facilitator draws the group's attention to the group memory from the previous meeting. The teacher(s) who was the object of the previous meeting's problem-solving activity reviews what actions he/she has taken to remedy the problem and what progress has been made since the last meeting. (During the "Closure" portion of the previous meeting, the teacher(s) whose problem or issue was discussed by the Group made a verbal commitment to the Group to try some action and report back to the Group—See "Closure.") For example, "I tried remaining with the first Reading Group for a few minutes after I gave them their assignment to make sure they were all "on task" before moving onto the second group. All but two of that reading group is now finishing their assignment by the end of the class period, so it is getting better than it was."

The teacher may seek additional feedback from the Group at this time or the Group may ask the teacher clarification questions about the actions the teacher has been taking. If the teacher feels that no progress toward solving the problem has been noted after he/she tried some new actions, a request for the item to be placed on the agenda again would have been made during the "agenda development" portion of the meeting.

In the beginning, the Review and Feedback portion of the meeting took on the flavor of a "story-telling" session and required considerable time to complete. Careful monitoring of this part of the meeting during the Friday inservice sessions reduced this time dramatically. After the first few meetings, this part of the meeting took less than ten minutes to accomplish.

PROBLEM-SOLVING. The Facilitator calls upon the teacher whose agenda item was listed as the first priority. The teacher states his/her problem/issue as briefly as possible, using measurable and quantifiable terms to describe the behavior of practice, if possible. For example, "When I ask the class a question, I find that I almost always respond to the student who raises his hand first. I asked Betty, my Peer Observer team member, to come into my class and watch what happened. She noticed that this happens almost every time I ask a question of the class. I just can't seem to react fast enough to stop myself and what I found out is that I'm calling on the same few students every time." Other teachers in the Group may ask clarification questions ONLY, at this time, but are not to give any advice or make any judgments. For example, "Does this seem to happen in one class more than in others" or "Are these students that raise their hands and that you call on the 'better' students in the class?" Avoid questions that really suggest advice or make judgments, i.e., "Are you afraid to call upon the "slower" students because they might give you the wrong answer?" or, in another instance, "Do you give your students the same respect you expect from them?"

The Facilitator now asks the other Group members, "What have YOU tried that has worked for YOU in a similar situation?" The way this is stated is really a key to the success of the group process. Note that the members are being asked to relate something they think "should" work for the person requesting the help. (Remember that each of us makes a change because we believe what we see or hear may work for US, that is, it satisfies a need or desire WE have. Essentially, we can listen to what has worked for others and think that perhaps that may work for us, too. The point is: Never give advice or make judgments! We really are our own "experts" and the answers lie within us. The Group may help us to actualize something within us or help us to have an insight about something we already know. This way of expressing ourselves, although somewhat awkward, at first, will ensure a judgment-free process and allow for trust, creativity and openness in our interactions with the Support Group members.)

Group members now share experience or solutions that have worked for them. For example, "I had a similar situation once in my third grade class. I tried....This really made a difference for me." or "Last year when I taught American History, I had some students who were always waving their hands before I even finished asking the question. What I did was use a deck of student name cards which I would shuffle at the beginning of each class. I would then turn over a card and read the student's name. I would then ask the question and quickly call upon that student to answer the question. After a while, the class got the idea and stopped waving their hands."

This part of the process was the most difficult for the Project teachers to implement. Rather than simply state, in a non-judgmental way, something he/she had done in the past that was successful, the tendency was to tell the other person what to do. Again, during the Friday training session with the teachers this process was focused upon and generally teachers were able to implement it as outlined.

At this point, if no one in the Group has any personal experiences to relate, someone in the Group, or the Facilitator, may request a departure from the rules. This simply allows the Group to brainstorm some ideas. Everyone in the Group is clear, however, that these ideas and techniques may or may not have been tried. Usually, no more than three or four minutes should be devoted to brainstorming any one topic.

The Facilitator now solicits from the Group "what the research" says about this particular practice or behavior. This is done so that the member being helped can compare what he/she has heard from the other Group members with respect to any research-based practices with which the Group may be familiar.

Specific researched-based classroom practices were presented to the staff of both schools during the Friday inservice sessions. These practices became the focus for the intervening weeks prior to the next inservice.

The teacher inservice program included role-playing situations wherein members practiced interacting with one another in a non-judgmental, non-evaluative manner.

CLOSURE. Following the problem-solving discussion, the Facilitator asks the teacher who requested help what techniques or ideas he/she might try to remedy the problem situation, i.e., "The Group has shared some techniques and ideas that have worked for them in similar situations (or, "We have brainstormed some ideas.") and you have heard what the research has to say. What do you think you might like to try?" The teacher makes his/her own conclusions about the actions he/she will take. It may be that the teacher will actually choose a few ideas that others have tried successfully and/or are research-based practices; it is just as likely that the teacher will select some action(s) that was not specifically presented by the Group, but, rather was "triggered" as a result of the Group discussion.

Once the teacher has stated what he/she intends to try, the Facilitator asks the teacher to make a commitment to the Group to report back at the next meeting of the Support Group (See: "Review and Feedback"). It is important that the teacher actually state what he/she will do and that he/she agrees to report back to the Group. This constitutes the verbal contract with the Group. It provides a degree of accountability, as well as allows the Group to receive reinforcement that they did, in fact, help a member of the Group.

It was found in the Project support groups that after the group became comfortable with the process, there was a tendency to neglect seeking the actual "verbal commitment" from the teacher. In almost all cases where this commitment had not been made, little attempt at changing the behavior had occurred from one meeting to the next.

The process now begins all over again with the next item from the prioritized agenda. When Groups are in their initial stages of forming, one or perhaps two problems or issues can be handled at a meeting. As Groups mature, however, it is not unusual to deal with three or four problems or issues. Regardless of the number of problems discussed, it is important that the Group adjourn at the agreed-upon time.

In the beginning when the Support Groups formed, there was a degree of group team-building that was necessary. "How much can I trust this group?" Will they laugh at me if I make a mistake?" "Are they evaluating me as a teacher?" Will I really get any help from them?" These are the types of questions and concerns that were typical among the Project teachers. Most of these teachers, at least during the first few years of the Project, had worked together for some time. This helped in terms of their readiness to accept such a program that might open them to some personal vulnerability.

The inservice training program addressed these issues and worked through a set of group activities to help the Project teachers feel more comfortable and productive as members of their Group. The expressed purpose of the Support Group is to help teachers improve their instructional effectiveness and to accomplish this in a safe and supportive environment. Initially, it required much time and effort to build this "safe and supportive environment." The effort, however, was deemed worthwhile by the Project staff and teachers. The final test of the impact of the Support Group can be examined after the Project has terminated and some time has passed. Will the groups still continue to operate? Will the teachers continue to find support and professional growth through the sessions?

LOCAL SCHOOL ADMINISTRATORS AND LEADERSHIP DEVELOPMENT

Each of the two districts in the Project have a superintendent and a principal who serve the entire school population. Both leaders are housed in the same building and often function as a team in providing leadership to the school. While generally the principal is responsible for day-to-day administration of the classrooms and the instructional programs, the superintendent is involved in these functions, as well. While teachers might usually talk with the principal about instructional matters, it is not uncommon for the superintendent to make himself available in these matters. As a result, both the superintendent and the principal attended all inservice sessions with their staffs and took part equally in the facilitation of the Project goals with teachers.

The most critical role of the administrators was that of active and vocal support of the aims of the Project and of the teacher participants. Regular monitoring of the Coaching process, visitations to classrooms, availability to staff, support of the new practices arising from the inservice sessions, providing classroom coverage for the peer observation program, facilitating common time for staff to meet these activities proved to be the most crucial to the success of the program.

Monitoring of the Coaching process: Specifically this involved making sure that teachers were holding support group meetings regularly; assuring non-interference with teacher support group agendas; announcing high expectations to staff regarding the frequency of support group meetings; generally making sure that the coaching process was, in fact, in place.

Availability to Staff: This involved responding quickly and efficiently to staff needs as pertains the Project; conducting regular and frequent meetings of staff to discuss issues surfaced by the Project; periodically attending support group meetings; availability to "cover" classrooms for peer observations.

Support of the New Practices Arising from the Inservice Sessions: Activities included participation in all inservice sessions with the teachers, participation at all leadership training sessions; assuring that current school policies and procedures are "in line" with research practice; providing materials and facilities to support the "new" practices; including the new practices as part of the teacher performance appraisal system; assuring the present methods of student evaluation and supervisory observation are consistent with the practices of the Project.

Providing Classroom Coverage for Peer Observation Program: Activities included personal coverage of teacher classroom, if necessary; providing paid substitutes or parent volunteers during peer observation (and/or support group) meeting times; adjusting existing schedules to accommodate the Coaching program.

Facilitating Common Time for Staff to Meet: The most critical activities included adjusting existing schedules—recess, lunch, starting and ending times, etc. to accommodate peer observations and support group meeting times; calling regular and frequent staff meetings to discuss issues arising from the needs of the Project; assisting with teacher schedule adjustments—playground duty, itinerant teachers; resolving time conflicts between athletics, extra-curricular activities and Project activities.

Many of these leadership functions arising from the needs of the Project were unfamiliar to the administrators at the start of the Project. Some simply arose from specific need as the Project progressed while others were known from the beginning. In all cases, however, when administrators neglected any of these functions for a length of time, concerns arose from the teachers. Often these would be revealed to the consultant/trainers during their classroom visitations on the day previous to the inservice workshop sessions. Such problems as lack of time for meetings, administrators not available to handle problems as they arise, no one available to provide coverage for an observation, principal did not attend teacher meeting, use of teacher agenda at support meetings to handle "administrative" matters, lack of follow-through with a given program or activity resulting from the regular inservice session. More often than not, these functions were neglected because of needs from non-participant staff members (high school teachers, for example) and the fact that in each school only the principal and the superintendent were available to perform such functions.

Many of the tasks that were required of the local administrators were usual tasks that might be performed by most small school leaders. The Project, however, with its emphasis on "change" and its focus on research-based classroom practice, required certain knowledge and skills that are not always found in such leaders. In order to assist the local leadership, a development program was instituted by the Project consultant staff.

Beginning the second year of the Project, the two consultants would meet on the Thursday prior to the scheduled teacher inservice with the four administrators of the two schools. At first, the activities of these sessions dealt primarily with information sharing. Sometime during the second year of the Project, it was decided to structure these meetings so that leadership development might be encouraged.

A leadership development program known as Leadership Mapping Program (LMP) was conducted by one of the consultants. At the outset of the Program, each of the leaders completed a leadership style instrument, as well as a survey designed to determine the degree to which each leader needed to change his behavior specific to the task of implementing the NIE Project. A discrepancy analysis was performed to determine significant personal and leadership behaviors most likely to assist in successful implementation of the Project. The administrators examined their own leadership style with respect to a set of research-based indicators, as well.

The results of this instrumentation provided specific individualized activities for each of the administrators in the form of a professional growth plan. The plan was tied directly to the leadership requirements of the NIE Project.

In addition, a needs assessment was completed by each of the administrators to determine other areas of concern which might be focused upon at subsequent leadership development sessions. Examples of topics selected by the group are: using standardized test results for program change, monitoring use of classroom learning time, developing observational skills, teacher performance appraisal, and the like.

A program of time monitoring based on the "time-on-task" literature was performed in each building. The building administrators in each respective building were trained to use an observational instrument to collect classroom time data. In addition, building-level use of time was likewise audited through the use of a survey known as the "Academic Efficiency Indicator" which was developed by McREL.

Other leadership activities included: satisfying individual administrator requests for specific resource materials such as professional articles, books and the like; assisting leaders to prepare and deliver dissemination programs to other professionals; providing opportunities for leaders to attend conferences and other professional activities; individual consultation to assist in increasing professional competencies.

CHAPTER III

WHO'S ON FIRST

This chapter contains a discussion of some of the intermediate outcomes identified in Figure 1. The outcomes in terms of changes in student behaviors are reported in Chapter IV. Originally, the student results were considered to be the most, perhaps the ONLY, important outcomes of the Follow Through Project. For several reasons, this did not turn out to be the case in Cotopaxi/Westcliffe. First, student achievement was good in these districts before the project started. Second, student engagement and achievement were considered relatively unimportant by the staff in the schools so they selected other outcomes as the major focuses for the inservice. Third, as illustrated in Figure 1, even if there were changes in student behavior, they could not be attributed to the treatment unless there were changes in teacher behaviors.

Unfortunately, as often happens in evaluation and field-based research, there was a serious mismatch between the data collected and the outcomes which we wished to document. Because no one instructional model was used, no specific teacher behaviors were identified which could be observed before and after training. At the request of the evaluator, a test of the content was developed by the trainers, but was not administered at the end of the inservice sessions. Due to the nature of the peer coaching and support groups, any documents created during these processes were considered confidential and could not be used for evaluation purposes. The following data were available and will be reported in this chapter: a school climate questionnaire, interviews with teachers involved in the project, a questionnaire administered by NIE, a measure of how time is allocated, and checklists completed by observers on instructional techniques and discipline.

Change in the support and collegiality of the teachers for each other and in the atmosphere of the school. Questionnaires measuring five areas of "school climate" were administered in the spring of 1983, in the springs of 1984, and in the spring of 1985. Respondents answered a total of 80 items in the areas of: student/faculty motivation (15 items), expectations (19 items), teacher professionalism (20 items), building support of teachers (20 items), and parental involvement (6 items). They were asked to rate their schools as high, medium, or low on each item. Responses were assigned numeric values (high = 3, medium = 2, low = 1) and average scores were computed. Since respondents were not identified in any way, responses could not be matched and so no statistical tests could be performed. The mean scores are included in Table III.1. Differences in means of more than +.50 were noted with asterisks in the table.

Table III.1
Summary of Means Scores on School Climate Questionnaire

	School 1			School 2		
	1982-83 (N=9)	1983-84 (N=5)	1984-85 (N=7)	1982-83 (N=9)	1983-84 (N=6)	1984-85 (N=4)
STUDENT/FACULTY MOTIVATION						
1. Special means exist to recognize and reward students who have worked hard, made progress, or accomplish something special.	2.89	2.80	2.43	2.00	1.33	2.75
2. Instructional techniques that are highly motivating are used such as "Team Tournament Games" or "Concept attainment."	1.89	2.40*	2.00	1.78	1.67	2.25
3. Teachers are able and willing to help each other with motivational ideas; staff meetings or other communications arrangements are set up to permit this exchange to go on.	2.22	3.00*	2.57	2.56	2.67	3.00
4. The building has a low absentee rate compared to other schools in the district or state.	2.56	2.60	2.86	2.56	2.00	2.00
5. There are no broken windows or other evidence of vandalism.	2.67	2.60	3.00	2.67	2.17*	2.00*
6. There is an absence of grafitti in the restrooms.	2.56	2.80	2.71	2.44	2.00	2.25
7. The playground equipment is in good repair and is all operable	2.44	2.40	1.86*	2.67	1.83*	1.75
8. There is an absence of litter in the building and on the playground.	2.33	2.60	2.14	2.67	2.00*	1.50
9. The furnishings are kept in good repair.	2.44	2.80	2.43	2.22	2.00	1.25
10. The building is well-lighted and clean.	2.00	2.00	2.29	2.44	1.67*	1.50
11. Teachers voluntarily participate in student activities, such as: playing students in a game of softball, operating booths at a school carnival, helping students prepare food for the school picnic, parties, etc.	2.33	2.80	2.29*	2.33	2.33	2.25
12. Teachers make an effort to get to know students and their parents on a personal basis.	2.89	2.80	3.00	2.44	2.67	2.25
13. Teachers will extend their day when requested to do so by students.	2.89	2.80	2.43	2.56	2.17	2.50
14. Teachers provide specific time during theday to meet with individual students who need and/or want help with academic or personal problems.	2.78	2.40	2.43	2.11	1.67	2.00
15. Teachers encourage students to discuss their problems.	2.56	2.60	2.43	2.22	2.50	2.25
Overall scale mean	2.49	2.63	2.31	2.38	2.05	2.10
EXPECTATIONS						
1. No one's "written off."	2.78	3.00	2.57	2.56	2.17	2.25
2. Some students aren't given easier work.	2.11	2.40	2.14	1.86	2.17	1.75
3. The same standards are held up to everyone with consistency.	2.11	2.80*	2.14*	1.67	2.00	2.50*
4. Grouping arrangements are not used to signal to some students they aren't expected to do as well as others.	2.22	2.20	2.29	2.22	2.00	2.00
5. Student academic work is displayed on bulletin boards, in halls and in classrooms, etc.	2.78	2.40	2.57	2.56	2.33	2.50

* indicates relatively large differences in mean responses

Table III.1 (cont.)

Summary of Means Scores on School Climate Questionnaire

	School 1			School 2		
	1982-83 (N=9)	1983-84 (N=5)	1984-80 (N=7)	1982-83 (N=9)	1983-84 (N=6)	1984-85 (N=4)
EXPECTATIONS (Cont.)						
6. Student academic projects are featured in the school.	1.89	2.00	2.29	1.67	1.33	2.00
7. Long term grouping is not done on an ability basis.	2.22	2.20	2.00	1.78	1.83	1.75
8. Teachers responses and support to students they perceive as low achievers is no different than their response to perceived high achievers.	2.44	2.40	2.00	2.22	2.00	2.00
9. Teachers give praise that is realistic and specific with respect to the performance.	2.33	2.60	2.29	2.44	2.50	2.25
10. Teachers give immediate praise for the academic performance.	2.56	2.60	2.57	2.22	2.33	2.25
11. Rewards for academic performance allows many students to receive recognition.	2.56	2.40	2.43	1.78	2.17	2.50
12. Procedures exist for immediate (daily or weekly) recognition of students' achievement.	2.56	2.00	2.29	1.44	1.50	2.25
Low achieving students are not:						
13. Reprimanded more.	2.00	2.20	2.43	2.00	2.17	2.25
14. Given easier questions to answer	2.22	2.00	2.14	1.89	2.17	2.00
15. Cut off sooner than high achievers.	2.22	2.20	2.14	2.00	2.50	1.75
16. Given less academic feedback.	2.44	2.40	2.14	1.67	2.00	1.75
17. Praised either less or more than others.	2.44	2.60	2.50	1.67	2.00	2.25
18. Treated impolitely.	2.33	2.60	2.29	2.33	2.67	2.00*
19. Grouped together.	2.00	2.00	2.29	1.56	1.83	1.50
Overall scale mean	2.21	2.37	2.29	1.90	2.09	2.08
TEACHER PROFESSIONALISM						
1. Teachers are willing to allow other and/or parents to visit their classrooms.	2.89	2.80	3.00	2.67	2.67	3.00
2. Teachers sometimes invite the principal or other administrators to visit their classrooms.	2.56	2.60	2.43	2.11	2.33	2.75
3. Teachers are willing to share successful ideas and strategies with each other.	2.67	2.80	2.86	2.22	2.67	2.75
4. Teachers help each other.	2.78	3.00	2.86	2.44	2.67	2.75
5. Teachers continue to attend classes/programs for individual growth.	2.67	2.60	2.43	2.56	2.50	2.75

Table III.1 (cont.)
Summary of Means Scores on School Climate Questionnaire

	School 1			School 2		
	1982-83 (N=9)	1983-84 (N=5)	1984-85 (N=7)	1982-83 (N=9)	1983-84 (N=6)	1984-85 (N=4)
TEACHER PROFESSIONALISM (Cont.)						
6. Teachers demonstrate professional integrity using sick leave, professional days, etc.	2.89	3.00	2.71	2.67	2.67	2.50
7. They cooperate in required meetings (PTA, curriculum,etc.)	2.89	3.00	2.57	2.44	2.33	2.50
8. They demonstrate a positive attitude toward their job.	3.00	2.60	2.71	2.44	2.33	2.25
9. Teachers share their suggestions for improvements openly.	2.89	2.20*	2.43	2.44	2.50	2.25
10. Faculty members personally welcome each new teacher.	2.78	2.80	2.29*	2.67	2.50	2.75
11. Grade level faculty members offer extra assistance.	2.63	NA	NA	1.78	2.00	2.50*
12. Faculty members invite new teachers to out-of-building luncheons.	1.56	1.50	2.00*	1.67	1.83	2.50*
13. Faculty members make sure new teachers are aware of the Parent Teacher conference routine.	2.22	2.80*	2.14*	2.13	2.20	1.75
14. Compliments are freely given.	2.56	2.20	2.14	2.22	1.67*	2.25
15. Faculty members enjoy each others' company.	2.44	2.60	2.43	2.67	2.33	3.00*
16. Faculty members acknowledge and are proud of the accomplishments of other faculty.	2.67	2.60	2.57	2.44	2.50	2.75
17. Faculty members are aware of each other's interests and special abilities.	2.33	2.60	2.29	2.22	2.33	3.00*
18. Faculty members seek solutions to differences in a positive, open manner.	2.44	2.60	2.29	1.67	2.00	2.75*
19. Faculty members feel teaching is a team effort with all contributing their best.	2.67	2.80	2.43	2.11	2.33	2.25
20. Faculty members share ideas and offer assistance to others.	2.67	2.60	2.43	2.13	2.17	2.75*
Overall scale mean	2.61	2.62	2.47	2.29	2.33	2.59
BUILDING SUPPORT TO TEACHERS						
1. Teachers participate on committees for curriculum study, and materials selection, etc.	2.67	2.20	2.29	2.22	1.67	2.50*
2. Teachers contribute suggestions and time to various school improvement projects.	2.78	2.40	2.14*	2.11	1.83	2.50
3. Teachers share responsibility for outcomes of school projects.	2.67	2.60	2.29	1.89	2.00	2.00
4. Cross-grade coordination of instruction occurs in the school.	1.67	1.80	1.50	2.11	1.67	2.25
5. Ample building-level emphasis on academic achievement is present.	2.11	2.40	2.17	1.78	1.50	2.00*
6. Workable arrangements have been made for handling discipline activities that require the involvement of the principal and other staff.	2.33	2.40	2.57	2.11	1.83	2.25
7. Praise and "strokes" are regularly provided to teachers.	1.67	1.60	1.71	1.67	1.50	2.25*
8. Personal concerns of teachers are listened to by the principal and other teachers.	2.22	2.40	2.43	2.56	2.67	2.25

Table III.1 (cont.)
Summary of Means Scores on School Climate Questionnaire

	School 1			School 2		
	1982-83 (N=9)	1983-84 (N=5)	1984-85 (N=7)	1982-83 (N=9)	1983-84 (N=6)	1984-85 (N=4)
BUILDING SUPPORT TO TEACHERS (cont.)						
9. Teachers have a say-so in building wide rules and activities that affect them.	2.67	2.60	2.86	2.56	2.17	2.75*
10. Staff time is available to share good ideas that other teachers use and to help teachers solve classroom problems.	1.67	1.60	1.86	2.11	2.00	2.75*
11. A few, building-wide rules or codes of conduct have been developed and everyone supports them and models them.	2.00	3.00*	2.57*	2.00	2.33	2.25
12. Workable job descriptions exist and/or the principal is willing to discuss and clarify job duties and tasks.	2.00	3.00*	2.43*	2.14	1.83	2.00
13. The principal makes him/herself available to discuss teachers' problems.	2.56	2.40	2.86	2.44	2.83	3.00*
14. The principal is generally aware of problems that exist within the building.	2.22	2.40	2.29	2.44	2.80	2.75
15. The principal is effective in relaying teacher concerns to the district office and vice versa.	2.33	2.25	2.29	1.85	1.60	2.75*
16. Disagreements are openly aired and resolved.	2.00	2.00	2.00	1.50	2.00	2.75*
17. There is a useable curriculum guide to direct instruction; the guide is used.	1.89	1.60	1.29*	1.33	1.67	1.00*
18. Teachers have an opportunity to learn what other teachers teach.	2.11	2.00	2.00	1.89	2.17	2.00
19. There have been meetings (or other procedures) for securing agreement about curriculum and goals between the teachers in the building and the teachers in the "feeder schools" they are connected to.	2.00	1.80	NA	1.67	1.50	1.75
20. Teachers who teach the same programs (grade level) teach the same objectives.	2.60	NA	NA	2.20	1.75	2.25
Overall scale mean	2.21	2.08	2.20	2.03	1.97	2.30
PARENTAL INVOLVEMENT						
1. Parents are given regular (e.g., weekly) reports on student progress and/or notification when students do something special.	1.89	1.80	2.14	1.33	1.83	2.00*
2. Parents/teacher conferences are held well in advance of a decision to give a failing grade or retain a student in a grade.	2.44	2.60	2.71	2.33	2.50	2.50
3. Suggestions are made to parents about what they can do to be involved in their student's learning.	2.33	2.60	2.57	2.00	2.33	2.50
4. Parents know what the discipline codes of the school are.	1.89	2.20	2.29	2.00	1.83	2.00
5. Parents are contacted when discipline problems emerge.	2.67	2.80	2.71	2.22	2.33	2.50
6. Parents know what is academically expected of their child.	2.00	2.20	2.57	1.78	1.83	2.25
Overall scale mean	2.20	2.37	2.50	1.94	2.11	2.29

The responses to the school climate questionnaire show very little change which can be attributed to the inservice program. There was no one area which consistently showed improvement for both schools across years. There are several possible reasons for the lack of demonstrated effect. It is possible that school climate or at least teacher perception of school climate is very difficult to change, and may in no way be related to other changes that occur. It may be that there is only a "minimal level" which is needed and that this was already present before the project began. It is also possible that the instrument used to measure the change in school climate was not sensitive to the changes which actually did occur. Some of the technical difficulties with this instrument are discussed in Technical Appendix A. Finally, the individuals who responded each year were different. The first year all participants and observers returned questionnaires. The second and third year only a portion of the participants returned questionnaires. Also, as explained in Chapter I, there was a large turnover of personnel in one of the schools in the final year. Thus, the responses may not be comparable.

A second source of information about the change in "school climate" was an open-ended questionnaire which was completed by teachers after the final observation. A copy of this questionnaire is included in Technical Appendix A. Nine teachers completed the questionnaires. The responses range from extremely negative to extremely positive. Most of the responses were positive, although not excessively so. In response to question F: "What did you learn from the inservices?", and question 10: "What do you feel was the best thing about the project?", eight of the teachers included remarks about school climate and improved professional relationships with the other teachers. Eight of the teachers also mentioned that they felt the support groups and peer observations were helpful, a positive outcome of the inservice, and that they expected to continue them.

Changes in instructional strategies or behaviors. Three aspects of teacher behavior were examined using a checklist completed by the classroom observers. These were: 1) clarity of goals and assignments, 2) clarity of classroom/school rules, and 3) use of motivational techniques. Each of these was broken down into specific behaviors which the observers indicated were either present or absent on the observation guide (see Technical Appendix A) by a check mark. Examples of these behaviors follow:

Clarity of goals and assignments
The teacher:
- spells out skills/knowledge to be acquired
- identifies major steps in tasks
- lists checkpoints to measure progress

Clarity of classroom/school rules
The teacher:
- uses oral reprimands and nonverbal cues
- has a visual list of rules
- deals with present behaviors only

Use of motivational techniques
The teacher:
- shows genuine zest and enthusiasm
- identifies the activities that will be fun for
- students

The number of check marks, indicating that the behavior was observed at least once, were summed in each category. The total scores for year 2 were averaged across the eight days of observations. For year 3 they were averaged across two days. The possible

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- deals with present behaviors only

Use of motivational techniques
The teacher:
- shows genuine zest and enthusiasm
- identifies the activities that will be fun for
- students

The number of check marks, indicating that the behavior was observed at least once, were summed in each category. The total scores for year 2 were averaged across the eight days of observations. For year 3 they were averaged across two days. The possible scores were: 13 for clarity of rules and assignments, 10 for clarity of school/classroom rules, and 7 for use of motivational techniques. These data were collected only for years 2 and 3. An estimate of the internal consistency (Cronbach's alpha coefficient) of these scales was calculated. The results of that analysis are presented in Table III.2.

TABLE III.2

Internal Consistency of Instructional Techniques Scales

	Reliability Coefficient	
	1982-83	1983-84
Clarity of goals/assignments	.75	.56
Clarity of school/classroom rules	.79	.59
Use of motivational techniques	.90	.71

The considerable difference in the internal consistency of the scales is troublesome. The recording of these behaviors required judgments on the part of the observers and it may be that between the second and third year the observers changed their definitions of the behaviors they were observing.

The average scores (across observations) for year 2 and year 3 were compared using a t-test for dependent means. The results of this analysis are contained in Table III.3.

TABLE III.3

Changes in Use of Instructional Techniques

		1982-83	1983-84	t	p
Clarity of goals and assignments					
(out of 13)	x	9.90	9.80	.25	.805
	SD	.78	1.30		
	N	10	10		
Use of motivational techniques					
(out of 7)	x	4.76	4.80	-.10	.921
	SD	1.16	1.27		
	N	10	10		
Clarity of classroom and school rules					
(out of 10)	x	6.68	6.75	-.28	.789
	SD	.97	1.32		
	N	10	10		

As can be seen from the above results, there is no evidence that there was an increase in the teacher's use of these instructional techniques from year 2 to year 3. There are several reasons why this result may have occurred. There may have been a lack of consistency in the observers' definition of these behaviors from one time to the next. Or the instrument used may not capture the behaviors which changed as a result of the workshops. Or the majority of the behavior change may have occurred between year 1 and year 2 when there was no data to evaluate this change. Or the teachers may have been exhibiting many of these behaviors before training began. It seems to be in this area that the trainers and teachers were most dissatisfied with the results of the evaluation. Both groups expressed the belief that, in fact, behavior changes had occurred, but that our instruments failed to document that change.

It was for this reason that questions concerning changes in instructional techniques and strategies were included in the final questionnaire. All the teachers indicated specific instructional techniques which they had tried or were currently using. These included: sponge activities, checklists of acceptable behaviors, clarification of class rules, cutting transition time, praising or emphasizing acceptable behaviors, asking "higher level" questions, memory training techniques, concept attainment, using inquiry, teaching inductive thinking, cooperative learning and synectics. Seven of the respondents also described the differences in their classrooms since the beginning of their involvement in the project. These differences included: being more organized, having better discipline, challenging children more, more efficient use of time, being more stimulating, giving less paper work, using more whole group instruction, using more inquiry and discovery, using classroom meetings, using peer tutoring, and letting children participate in decision-making.

The observers also recorded the frequency with which teachers used different classroom management or discipline techniques. Every time the use of one of the ten techniques was observed, the observer placed a check mark beside it on the observation guide (see Technical Appendix A). These frequencies were averaged across the eight observations in year 2 and the two observations in year 3. These data were analyzed in two ways. First, the average total frequency of disciplinary actions were compared for years 1, 2, and 3. It was anticipated that these would decrease due to better classroom management techniques. The results of this analysis are reported in Table III.4.

TABLE III.4

Changes in Total Frequency of Disciplinary Actions

	1981-82		1982-83		1983-84		F	p
	x	SD	x	SD	x	SD		
total freq.	14.50	6.89	15.03	1.89	9.30	3.28		
linear trend							8.77	.016
quadratic trend							4.54	.06

This analysis showed that after a small initial increase in the total number of disciplinary actions per day from year 1 to year 2, there was a significant decrease in this behavior in year 3. This is an expected change in behavior.

The second analysis was to determine if the relative frequency (or proportion) of appropriate or positive disciplinary techniques increased and the proportion of negative or inappropriate disciplinary techniques decreased over the three year period. These proportions were analyzed using a MANOVA trend analysis to determine if there was a linear or quadratic trend. The results of this analysis are reported in Table III.5.

TABLE III.5

Changes in Relative Frequency of Various Disciplinary Techniques

Behavior	1981-82 $\bar{x}$	1981-82 SD	1982-83 $\bar{x}$	1982-83 SD	1983-84 $\bar{x}$	1983-84 SD	F	P
Positive behaviors								
teacher stops inappropriate behavior immediately	.17	.15	.11	.06	.11	.05		
linear trend							1.84	.21
quadratic trend							1.15	.31
teacher rewards a good behavior	.08	.10	.11	.09	.14	.13		
linear trend							2.05	.19
quadratic trend							.01	.95
teacher purposely moves toward and stops near a behavior problem	.11	.10	.09	.05	.16	.08		
linear trend							1.42	.27
quadratic trend							6.72	.03
teacher touches a student as a form of positive reinforcement	.03	.04	.09	.05	.04	.05		
linear trend							.33	.58
quadratic trend							22.39	.001
teacher uses direct, simple reprimand	.47	.29	.36	.07	.22	.08		
linear trend							6.86	.03
quadratic trend							.21	.65
total positive behaviors	.86	.16	.76	.14	.67	.16		
linear trend							13.84	.005

Behavior	1981-82 $\bar{x}$	1981-82 SD	1982-83 $\bar{x}$	1982-83 SD	1983-84 $\bar{x}$	1983-84 SD	F	P
Negative Behavior								
teacher leaves students alone	.05	.06	.04	.04	.05	.06	.01	.94
linear trend							.01	.94
quadratic trend							.98	.35
teacher waits to stop or ignores inappropriate behavior	.03	.05	.08	.09	.16	.11		
linear trend							22.44	.001
quadratic trend							.56	.47
teacher ignores a good behavior	0	0	.01	.02	.09	.08		
linear trend							14.76	.004
quadratic trend							6.59	.03
teacher is impolite to students	.016	.02	.010	.02	.007	.02		
linear trend							1.00	.34
quardratic trend							.09	.77
teacher uses indirect form of reprimand	.06	.10	.10	.03	.01	.03		
linear trend							3.56	.09
quadratic trend							12.32	.007
total negative behaviors	.14	.16	.24	.14	.32			
linear trend							13.84	.005

It is difficult to make any general statements about the patterns of positive and negative teacher behavior techniques based on the individual behaviors. However, overall, the use of positive discipline techniques as a category show a definite downward trend. Conversely, the use of negative discipline techniques as a category show a definite upward trend. It may be that the training was confusing or contradictory on the subject of disciplinary techniques. However, it should be remembered that these proportions represent very small frequencies or actual occurrences of behaviors.

Change in use of time. Several ways in which teachers used time were examined for this evaluation. First, the percent of time teachers spent in beginning managerial activities, transition, giving assignments, disciplining, working with one or two students while others wait, and ending managerial activities were added together to form a scale called instructional management time. Second, the percent of time spent on social activities, outside interruptions, and other breaks were added together to form a scale called non-instructional use of classroom time. Third, the percent of time spent on lavatory break, recess, lunch, breaks between classes and other out of class time were added together to form a scale called scheduled interruptions. Finally, the percent of time set aside for reading and math was recorded as allocated time. The percentages of time spent in these activities was collected in the classrooms of all of the ten teachers involved in the project by trained outside observers. The first data collection was done in the spring of 1982 before any training occurred. Observations were made in each teacher's classroom on three different days and the amount of time spent averaged across the three days. During the 1982-83 school year, eight observations were made (approximately one a month) and averaged. During the 1983-84 school year, two observations (one in September and one in May) were done in each classroom and averaged. During the 1983-84 school year, two observations (one in September and one in May) were done in each classroom and averaged. These averages were compared using a repeated measures ANOVA. The results of the analysis of these variables are reported in Table III.6.

TABLE III.6

Percentage of Time Spent in Various Activities

Activities	1981-82		1982-83		1983-84		F	P
	x	SD	x	SD	x	SD		
Instructional Management								
beginning managerial activities	3.76	1.12	1.81	.32	3.09	.72	13.67	.0002
transition time	1.92	.57	4.66	1.35	3.44	1.24	22.72	.0001
giving assignments	1.22	.83	2.32	.97	2.18	1.35	5.75	.01
disciplining	.24	.35	.24	.23	.26	.39	.013	.78
working with small group while others wait	.14	.43	.08	.13	.31	.51	.82	.46
ending managerial time	2.52	1.05	1.17	.46	1.92	.62	10.83	.0008
TOTAL managerial time	9.80	1.80	10.28	2.01	11.18	2.01	3.39	.056
Non-instructional In-class Activities								
social activities	1.75	1.48	2.27	1.27	4.83	3.21	8.95	.002
outside interruptions	.25	.26	.39	.44	.50	.47	1.00	.39
other interruptions	.15	.39	.81	1.06	.93	1.27	4.13	.03
TOTAL	2.16	2.02	3.47	2.06	6.25	4.30	9.32	.002
Scheduled Interruptions								
lavatory break	1.22	1.90	1.18	.98	2.17	1.41	2.05	.16
lunch	16.30	2.53	9.79	1.87	9.42	4.66	14.09	.0002
recess	11.01	2.87	11.77	1.71	13.59	2.54	6.84	.006
breaks between classes	.08	.16	.92	.73	3.84	2.45	19.67	.0001
other interruptions	.08	1.11	3.14	1.11	.27	.30	39.43	.0001
TOTAL	24.47	3.87	26.80	3.48	29.28	5.94	1.56	.24
Allocated Time								
reading	no data		16.23	4.05	16.93	6.59	-.36	.72
math	no data		9.69	2.37	11.07	3.19	-1.35	.209

Several interesting effects of the treatment emerge from this analysis. First, the percent of time spent on instructional management activities as a category increased. The increase was statistically significant. This may have reflected a difference in the way lessons were presented. Instructional practices presented during training emphasized this. It should not be viewed necessarily as wasted time. A measure of the quality of this time or how it was actually used is required to judge if this is a positive or negative effect.

Second, within this category, almost every behavior followed the same pattern. There was a large change, either an increase or a decrease, in every identified use of time after the first year of training. After the second year of training, a smaller change occurred in the opposite direction, i.e. moving back toward the original value. This may have been due to the fact that training programs almost always have the largest impact after the first year. It may also have been because some observer judgment was required in deciding when these activities began and ended. Some inconsistency and inaccuracy in making these judgments is to be expected which may have produced some "wobble" in the scores.

Non-instructional use of classroom time increased from year 1 to year 3. However, during year 3, only two observations were done and one of these occurred on a day when birthdays were celebrated. Thus, the unusually large amount of time spent on social activities was due to a non-representative sample of classroom activities. There was some indication that the percent of time spent in this category was increasing; however, the results were inconclusive.

Time use for scheduled interruptions, as a category, remained relatively constant over the three years. Within this category some interesting results can be observed. Lunch time was reduced by the school administration as a result of the training. Recess time, which is more directly controlled by the teachers, increased at the same time. The percent of time consumed by breaks between classes increased due to scheduling for music. However, other interruptions were considerably reduced.

The percent of time devoted to reading instruction increased. The increase in the percent of time devoted to math was even larger although the increase was not statistically significant in either case.

In summary, the way teachers used the school day appeared to be directly affected by the workshops. Most of the changes which occurred were in the direction which one would predict given the content of the training.

Summary. Although we cannot quantify these outcomes, teachers report that they have changed the way they teach. They use different instructional techniques and have a different focus. Their comments also indicate that they found the peer observations and support groups useful and will try to continue with the activities.

CHAPTER IV

WHAT DOES IT ALL MEAN?

INTRODUCTION

When the follow-through proposals were funded in 1980, researchers in education were very excited about the notion of engagement rate or time-on task. At last we thought we had a student behavior which was quantifiable, relatively easy to observe, and seemed to be positively associated with achievement. The four follow-through projects included data collection procedures which were intended to provide the information necessary to determine if there was a causal link between teacher behavior, engagement rate and student achievement. As with most field-based experiments, there were many practical considerations which prevented the actual implementation from precisely following the research design. Included in this chapter is a summary of the research study as it was actually conducted. Those readers who are interested in more detailed description of the sample, methodology and instruments, intervention, and other outcomes are referred to other chapters in this report.

DESCRIPTION OF SAMPLE

Two school districts were involved in this study. Both were small—consisting of one school of less than 400 students, K-12—in rural, mountain communities in Colorado. All the teachers who taught grade K-4 in these schools, usually one per grade, were involved in the inservice training program. Data are not reported for the kindergarten teachers. The principals and superintendents in both districts also attended the inservice meetings. After the first year of the Project, one district changed superintendents and principal; the other district remained stable until the fourth year of the Project when a number of changes took place. The changes are summarized in the following table.

TABLE IV.1

CHANGE IN PROJECT PARTICIPANTS

	SCHOOL 1				SCHOOL 2			
GRADE	Yr1	Yr2	Yr3	Yr4	Yr1	Yr2	Yr3	Yr4
1	A	A	A	A	B	B,C	B	D,E
2	F	F	F	F	G	G	G	H
3	I	I	I	I	J	J	J	J
4	K	K	K	K	L	M	M	N
Principal	O	P	P	P	Q	Q	Q	R
Sup't	S	T	T	T	U	U	U	U

*Each letter indicates a different staff member

Class sizes were small averaging about 20 students. Up to fifteen children were observed in each classroom each year, although there is not always complete data for all these children. Children were tracked from the time they entered first grade until they were promoted into fifth grade, or the project ended. Children who moved were replaced by other children. The number of children who were observed each year and across years is reported in Table IV.2.

TABLE IV.2

NUMBER OF STUDENTS OBSERVED

GRADE	1			2			3			4			Total		
SCHOOL	1	2	tot	1	2	tot	1	2	tot	1	2	tot	1	2	tot
Yr1 data	10	15	24	15	15	30	13	14	27	9	15	24	46	59	105
Yr2 data	14	14	28	10	15	25	15	15	30	13	14	27	52	58	110
Yr1 & Yr2	--	--	--	8	11	19	12	12	24	12	9	21	32	32	64
Yr3 data	15	14	29	15	13	28	13	14	27	12	14	26	55	55	110
Yr2 & Yr3	--	--	--	13	12	25	8	13	21	10	14	24	31	39	70
Yr1 - Yr3	--	--	--	--	--	--	7	11	18	9	11	20	16	22	38
Yr4 data	15	29*	44	14	11	25	14	11	25	15	10	25	58	61	119
Yr3 & Yr4	--	--	--	13	11	24	10	11	21	11	10	21	34	32	66
Yr2 - Yr4	--	--	--	--	--	--	8	11	19	8	9	17	16	20	36
Yr1 - Yr4	--	--	--	--	--	--	--	--	--	7	8	15	7	8	15

*2 classrooms

The children in this study were identified as medium to low-income. Their parents generally were employed in agriculture or in businesses supported by agriculture. Many of the children had siblings who were included in the study. There were no minority or culturally different children in these classes.

DESCRIPTION OF TREATMENT

The treatment in this project was inservice provided to the teachers. Due to the cost of transporting students to and from school, these districts held school four days a week. The school day was lengthened so students were in school the same number of hours as students who attended five days a week. Thus, teachers were paid to attend a day of inservice. Generally, trainers spent the days preceding the inservice in the classrooms observing or coaching.

The inservice had two separate agendas. The first was based on the school effectiveness research. The topics included in this area included time on task, allocated time, peer coaching, group problem solving for teachers, teaching to objectives, curriculum-test congruence, and similar topics. The second emphasis was on exposing models of teaching which would enrich the instruction program e.g., mastery learning, inquiry, creative teaching. A more detailed description of the treatment is included in Chapter II. Demonstrations by experienced teachers were also included in this portion of the inservice program.

The objectives in terms of behavior change were never explicitly stated. Teachers where not required to use any specific techniques or activities; rather they were encouraged to try new ideas and share the results with the group at the next inservice. Although it was initially planned to compare student outcomes for teachers who implemented the training to a greater or lesser degree, the small number of teachers and the lack of specific objectives made this impractical.

DEPENDENT MEASURES

Two dependent measures were used in this study. One was engagement rate. The other was scores on standardized achievement tests.

Engagement rate was calculated for each observed student in reading and arithmetic. A trained observer made a visual sweep of the selected children every 10 minutes during reading and arithmetic instruction. On each sweep, the observer indicated whether each child was engaged in the teacher-assigned task or not so engaged. These observations were made on three days during the spring of 1982, on eight days during 1982-83, on two days during '983-84, and on two days during 1984-85. The number of times each child was reported as engaged was divided by the total number of times the child was observed. This ratio, which ranges from .00 to 1.00, was defined as engagement rate.

Every spring all the children were given a standardized achievement test. During the spring of 1982 both schools used the Iowa Test of Basic Skills (ITBS). In 1983 school two changed to the Stanford Achievement Test (SAT), while school one continued to use the ITBS. The scores reported to the district included stanines, grade equivalent scores, and percentile ranks. Normal curve equivalent (NCE) or standard scores were not reported. In an effort to improve the comparability of scores from different tests and across different grade levels, the percentile ranks were converted to z-scores (assuming a normal distribution). The z-scores can range from -2.32 to +2.32. The z-score at the 50th percentile is .00.

Another decision regarding comparability was which two subtests scores to compare. Because of the great variability in the content of similarly named subtests, only total reading test and total arithmetic test scores were recorded. Using these test scores also improved the probability that most of the content which was taught would be represented on the test. If the scores for these subtests was not reported for a particular student, the achievement test scores were recorded as missing for that student..

RESEARCH DESIGN

Originally, the research design included collecting data from a comparison group. However, the unique characteristics of the two school districts made finding comparable data unlikely and the cost of collecting such data prohibitive. Therefore, this is a single group pre-post test design. The weakness of this quasi-experimental design are well-documented. Therefore, any conclusions drawn from the results of this study must be considered tentative.

The questions which were addressed by this study included:

1. What were the effects of the inservice on student engagement rate?
    - o average engagement rate (ER) of a teacher's class compared to average ER for that teacher's classes in previous year's.
2. What were the effects of the inservice on student achievement?
    - o average achievement scores of a teacher's class compared to average achievement scores for that teacher's classes in previous year's.

- individual student's achievement test scores compared to the achievement test scores for that student in previous year's.

3. What is the relationship between student engagement rate and achievement?

RESULTS

ENGAGEMENT RATE

Displayed in Table IV.3 are the number of students per class for whom engagement rate was complete and the means and standard deviations of those scores in reading and arithmetic. The same information is presented graphically in Figures IV.1 and IV.2. Two observations can be made from these data. First, the average scores are quite high and the scores are distributed in a negatively skewed pattern. Second, there is a clear patter in reading which, although less prominent, is also present in arithmetic. There is a general increase from year one to year two, another general increase from year two to year three and a general decrease from year three to year four. The scores fall within a much smaller range in year two and year three than in year one or year four.

Determining what comparisons to make using these data and the appropriate statistical tests for the comparisons depended on the underlying assumptions we made about change in engagement rate. If we assumed that engagement rate depended on each individual student's reactions to how the teacher managed the class, then each class of children the teacher had from year to year could be viewed as an independent sample. This assumes that each child's engagement rate was independent from the other children in the same class, that engagement rate is primarily a function of teacher behavior, and that children in each successive year received a different "treatment" due to the teacher inservice. In this case, the appropriate comparison was between the mean engagement rate from year to year and was tested using a t-test for independent samples. Although one-was ANOVAs or two-way ANOVAs might have been used, this would have resulted in much loss of data due to teachers entering and leaving the project at different points. In addition, the unequal numbers and variances were more easily accommodated by t-tests that ANOVAs. The results of this analysis are presented in the following table.

TABLE IV.3

CLASS LEVEL AVERAGES

TEACHER YEAR	READING						ARITHMETIC					
	ENGAGEMENT			Z-SCORE			ENGAGEMENT			Z-SCORE		
	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD	N	$\bar{x}$	SD
A												
1	9	.82	.07	-	no data		4	.84	.10	4	-.06	1.04
2	14	.90	.04	13	1.06	.58	14	.97	.04	–	no data	
3	13	.96	.06	15	.67	.91	13	.95	.05	15	-.41	.68
4	.15	.89	.08	15	.47	.73	15	.94	.03	15	1.04	.73
B												
1	14	.78	.12	14	.66	1.24	9	.63	.26	14	.65	.92
2	10	.92	.04	14	.25	.87	–	—	—	–	—	—
3	11	.93	.05	9	.49	.66	11	.98	.06	9	.72	.56
O												
4	13	.89	.11	15	1.05	.82	13	.94	.09	15	.64	.54
E												
4	11	.92	.08	14	.09	.63	5	.89	.12	14	-.45	.79
F												
1	14	.66	.14	15	.07	.68	14	.74	.16	15	-.13	.55
2	9	.91	.05	10	.65	.68	9	.94	.05	11	.43	.81
3	13	.91	.07		no data		13	.92	.10	13	.07	.70
4	13	.71	.15	12	.50	.68	13	.82	.13	13	.24	.55
G												
1	14	.86	.10	15	.50	.58	14	.92	.08	15	.38	.52
2	15	.42	.05	14	.64	.68	15	.89	.06	14	.58	1.05
3	4	.95	.07	10	.84	.84	9	97	.06	10	.78	.60
H												
4	7	.78	.07	11	.25	1.03	7	.82	.21	11	.11	.81
I												
1	11	.87	.10	13	.55	.79	13	.67	.16	13	-.22	1.20
2	15	.91	.07	14	.57	.74	15	.87	.11	13	.40	.68
3	4	.98	.04	13	.61	.39	9	.86	.14	13	.49	1.02
4	14	.94	.06	14	.38	.63	14	.90	.09	14	.45	.63
J												
1	13	.73	.21	13	.08	1.05	13	.74	.16	13	.42	.74
2	13	.84	.13	15	-.20	.94	15	.80	.10	15	-.27	.77
3	12	.93	.08	14	.34	.56	12	.94	.10	14	.26	.97
4	4	.90	.14	11	.74	.58	9	.86	.15	11	.68	.74
K												
1	4	.91	.07	9	.89	.73	9	.86	.15	4	.39	1.00
2	13	.41	.08	13	.44	.90	13	.89	.06	13	.33	.92
3	11	.97	.07	12	.22	.95	12	.95	.10	12	-.07	.77
4	13	.99	.03	15	.43	.93	14	.93	.11	15	.16	1.12
L												
1	11	.95	.03	15	1.07	.54	15	.92	.12	15	.34	.71
M												
2	14	.90	.07	13	-.07	.67	13	.89	.09	13	-.13	.80
3	12	.97	.04	4	.24	.73	12	.93	.10	4	-.32	.82
N												
4	9	.86	.08	10	.75	.59	9	.88	.10	10	-.07	.69

$\bar{x}$ = mean SD = standard deviation

FIGURE IV.1

AVERAGE CLASS ENGAGEMENT RATE IN READING

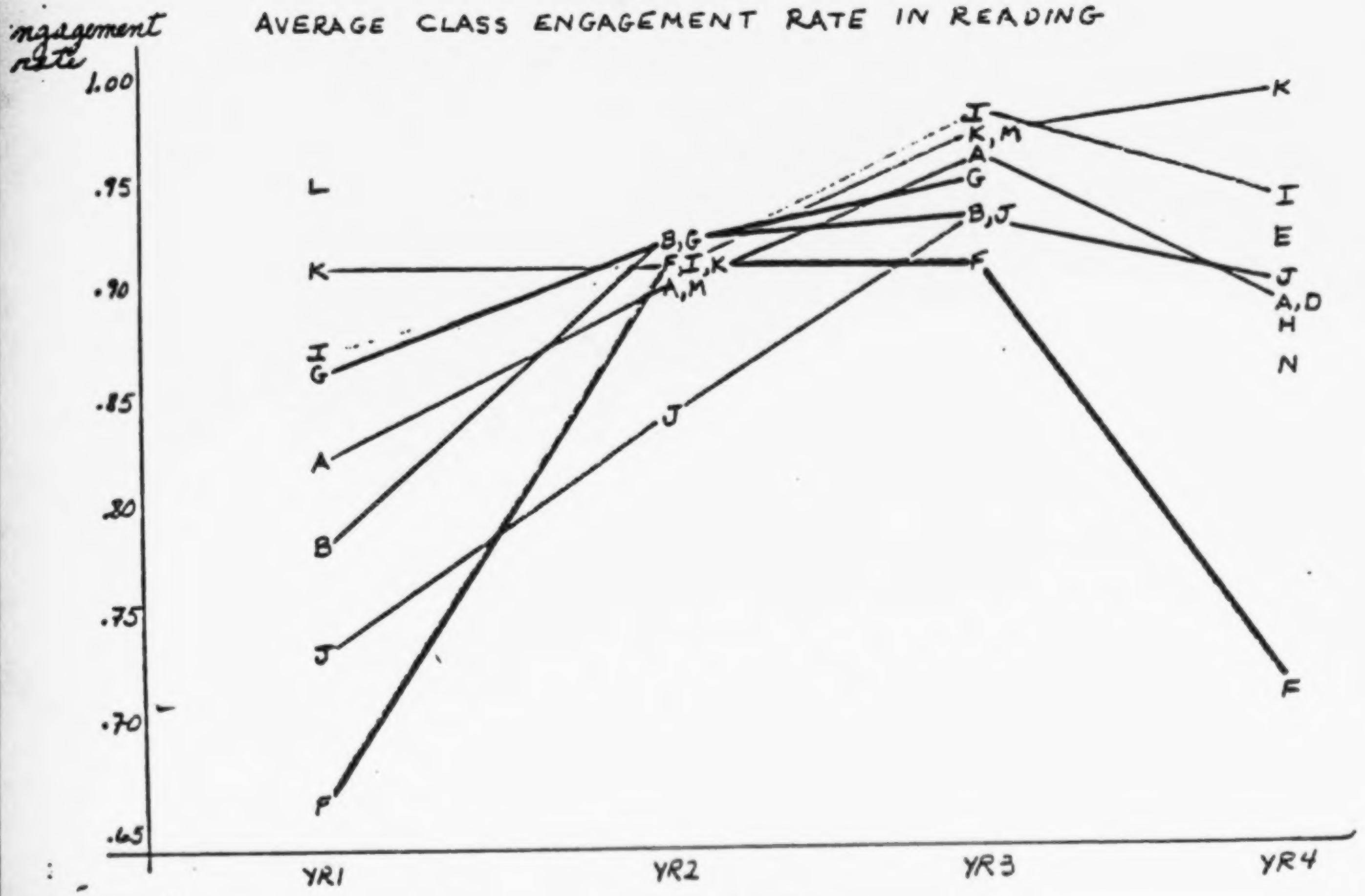


FIGURE IV. 2

AVERAGE CLASS ENGAGEMENT RATE IN ARITHMETIC

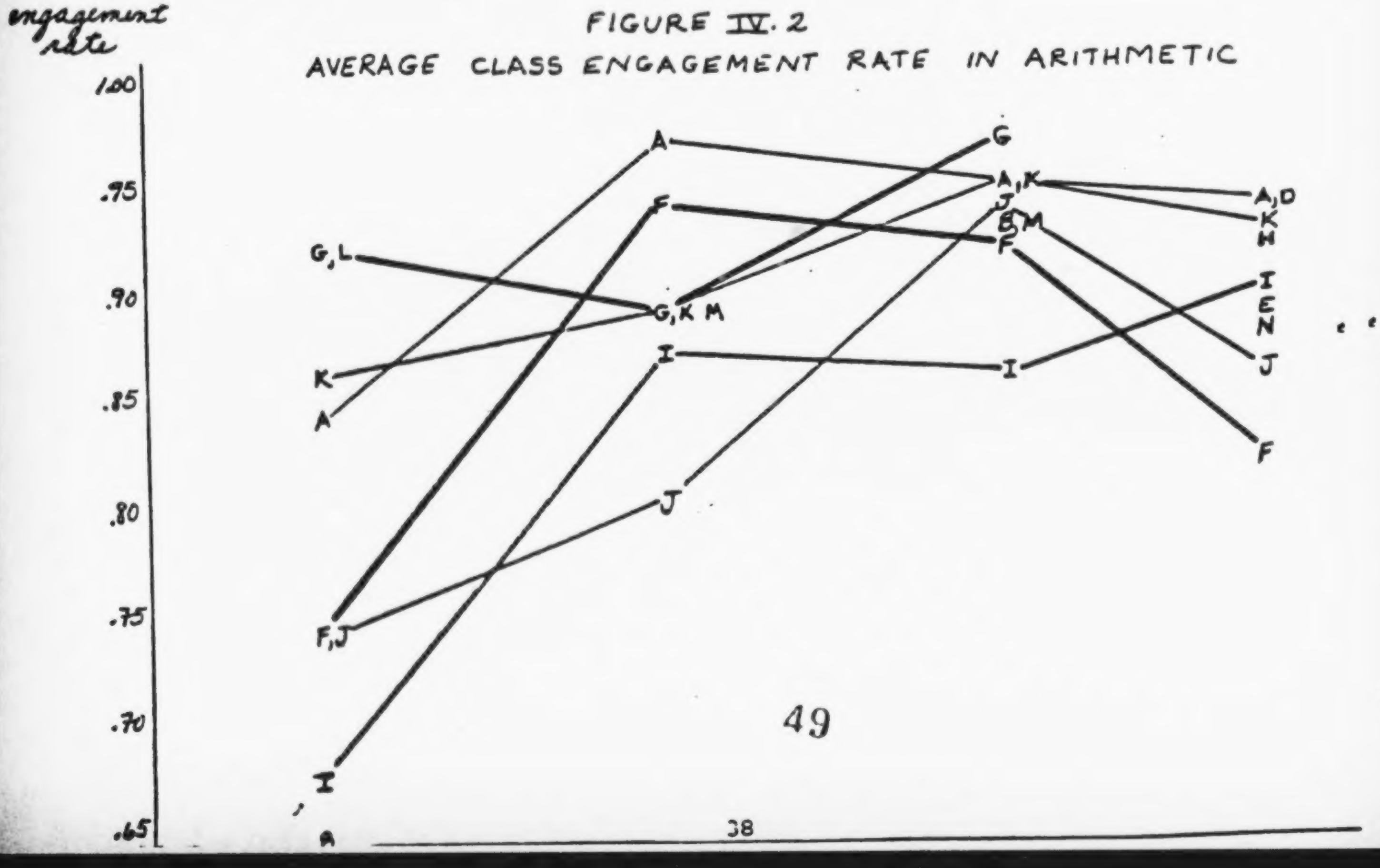


TABLE IV.4

INDEPENDENT T-TEST OF CLASS ENGAGEMENT RATE

Teacher	READING				ARITHMETIC			
Year	$\overline{X}_1 - \overline{X}_2$	d_f	t	p	$\overline{X}_1 - \overline{X}_2$	d_t	t	p
A								
1 vs 2	*-.07	21	-3.04	<.01	-.13	21	-4.43	<.001
2 vs 3	-.06	26	-17.82	<.001	.02	25	1.21	>.20
3 vs 4	+.07	27	2.70	<.02	.01	26	.53	>.20
B								
1 vs 2	-.14	22	-3.52	<.01	-	-	-	-
2 vs 3	-.01	19	-.80	>.20	-	-	-	-
F								
1 vs 2	-.25	21	-5.09	<.001	-.20	21	-3.70	<.01
2 vs 3	-.003	20	-.19	>.20	+.02	.20	.49	>.20
3 vs 4	.20	24	18.29	<.001	.10	24	10.64	<.001
G								
1 vs 2	-.06	27	-2.32	<.05	.02	27	.97	>.20
2 vs 3	-.02	22	-1.06	>.20	-.08	22	-3.09	<.01
I								
1 vs 2	-.04	24	-1.27	>.20	-.18	26	-3.45	<.01
2 vs 3	-.07	22	-2.81	<.01	-.01	22	-.22	>.20
3 vs 4	.04	21	1.78	<.10	-.04	21	-.92	>.20
J								
1 vs 2	-.12	24	-8.54	<.001	-.06	26	-1.27	>.20
2 vs 3	-.09	23	2.00	<.10	-.14	25	-3.67	<.01
3 vs 4	.03	19	.68	>.20	.08	19	1.46	<.20
K								
1 vs 2	.01	20	.24	>.20	-.03	20	-.73	>.20
2 vs 3	-.07	22	-2.24	<.05	-.06	23	-1.81	<.10
3 vs 4	-1.28	24	-3.35	<.01	.02	24	.42	>.20
M								
2 vs 3	-.07	24	-3.24	<.01	-.05	23	-1.30	>.20

*A negative value indicates an increase from the first year to the second.

Of the thirteen comparisons of first versus second year of participation in the project, eleven showed an increase in the second year. Eight of these were statistically significant. Of the fifteen comparisons of second versus third year of participation in the project, thirteen showed and increase. Eight of these were statistically significant. Of the ten third versus fourth year comparisons, eight showed a decrease in the fourth year in average engagement rate. Three of these were statistically significant. The information in Table IV.4 also shows that there was a similar pattern in standard deviations from year to year.

An argument could be made that, in fact, the data from year to year were from dependent samples. This assumes that the average engagement rate was completely under the control of the teacher and resulted from the group's reaction to the teacher's behavior. It also assumes that the student groups from one year to the next were basically the same and that each student's engagement rate was dependent upon the engagement rate of the other students in the classroom. For this comparison a t-test of dependent samples was used. This tested whether there was a statistically significant change in the average engagement rate among the teachers from one year to the next. The results of this analysis are presented in Table IV.5.

TABLE IV.5

DEPENDENT T-TEST OF AVERAGE ENGAGEMENT RATE

	N	$\bar{X}_1$	$\bar{X}_2$	d	s_d	t.	p
1982 vs 1982-83							
READING	7	.80	.99	*-.10	.08	-3.11	<.05
ARITHMETIC	6	.79	.89	-.10	.10	-2.44	<.10
1982-83 vs 83-84							
READING	8	.91	.95	-.05	.03	-3.96	<.01
ARITHMETIC	7	.89	.93	-.06	.06	-1.84	<.20
1983-84 vs 84-85							
READING	5	.95	.88	.07	.08	1.91	<.20
ARITHMETIC	5	.92	.89	.03	.06	1.21	>.20

The negative value indicates that X_2 is larger that X_1

As can be seen from these comparisons, the largest changes occurred during the first year of treatment. The increase in reading was statistically significant and the increase in arithmetic approached significance. Although the average engagement rate continued to increase after the second year, only the increase in reading was statistically significant. During the third year of treatment, the average engagement rate decreased although this decrease was not as large as the increase of the previous two years.

A third way to examine these data depended on the assumption that engagement rate is a function of student characteristics, such as interest, ability, previous experience, and development level. If this were the case, then the appropriate analysis was at the student level. One such analysis was a comparison of student engagement rate from year to year using a t-test for dependent samples. Because there was an expectation that older children would have higher engagement rates than younger children, the analysis was done for each grade level. The results of these analysis are presented in Table IV.6. They are also represented graphically in Figure IV.3 and IV.4.

TABLE IV.6

DEPENDENT T-TEST OF STUDENT ENGAGEMENT RATE

READING	N	$\bar{y}_1$	$\bar{y}_2$	$\bar{d}$	s_d	t	p
Grade 1 - 2							
Yr1 - Yr2	18	.80	.91	*-.12	.10	-5.01	<.001
Yr2 - Yr3	17	.90	.91	-.01	.07	-.59	>.20
Yr3 - Yr4	15	.95	.74	.21	.14	5.70	<.001
Grade 2 - 3							
Yr1 - Yr2	20	.76	.87	-.10	.18	-2.62	<.02
Yr2 - Yr3	16	.93	.96	-.03	.06	-2.34	<.05
Yr3 - Yr4	15	.91	.91	-.00	.13	-.10	>.20
Grade 3 - 4							
Yr1 - Yr2	20	.77	.90	-.13	.19	-3.09	<.01
Yr2 - Yr3	19	.88	.97	-.09	.09	-4.23	<.001
Yr3 - Yr4	15	.95	.91	.04	.07	2.42	<.05
ARITHMETIC							
Grade 1 -2							
Yr1 - Yr2	13	.71	.92	-.21	.22	-3.40	<.01
Yr2 - Yr3	17	.96	.93	.03	.11	.93	>.20
Yr3 - Yr4	14	.96	.82	.13	.19	2.60	<.05
Grade 2 - 3							
Yr1 - Yr2	21	.83	.82	.01	.20	.18	>.20
Yr2 - Yr3	16	.91	.93	-.02	.12	-.77	>.20
Yr3 - Yr4	15	.94	.86	.08	.15	2.07	<.10
Grade 3 - 4							
Yr1 - Yr2	21	.67	.88	-.21	.15	-6.42	<.001
Yr2 - Yr3	22	.80	.94	-.14	.15	-4.55	<.001
Yr3 - Yr4	15	.88	.91	-.03	.17	-.78	>.20

*A negative value indicates that y_2 is larger y [illegible] REDUCE

FIGURE IV. 3

AVERAGE STUDENT LEVEL ENGAGEMENT RATE IN READING

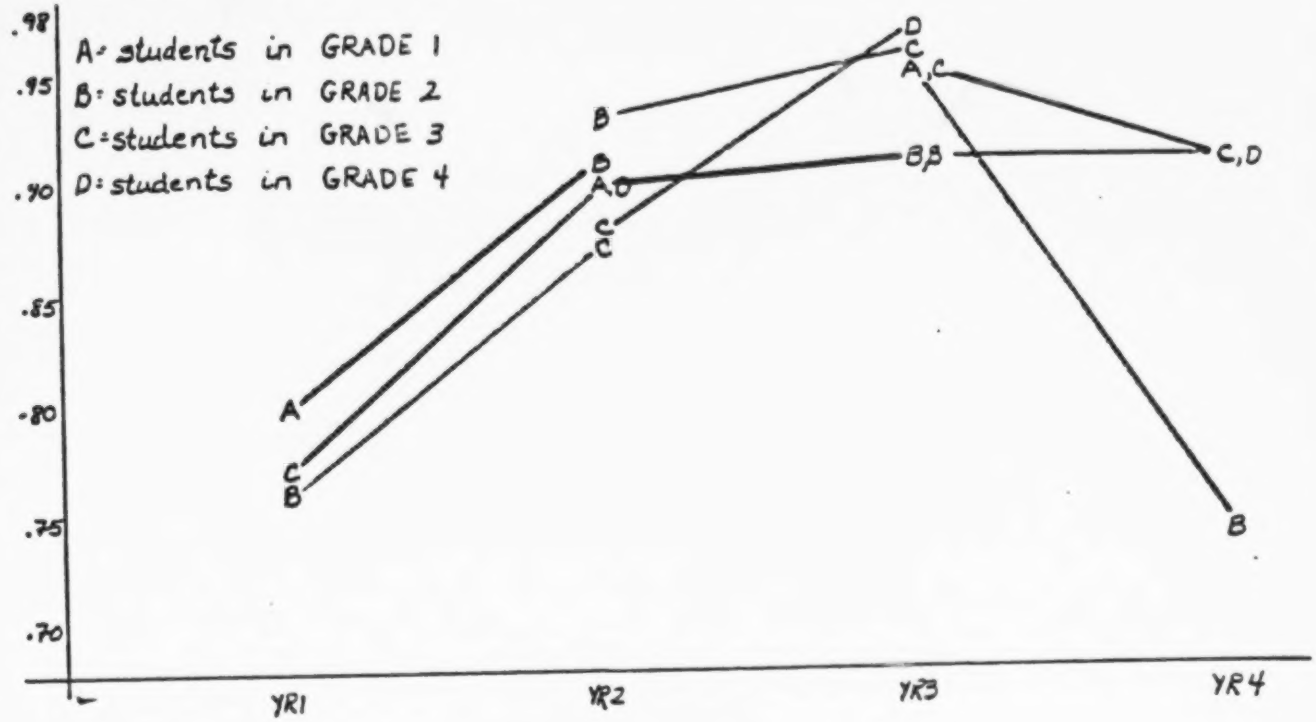
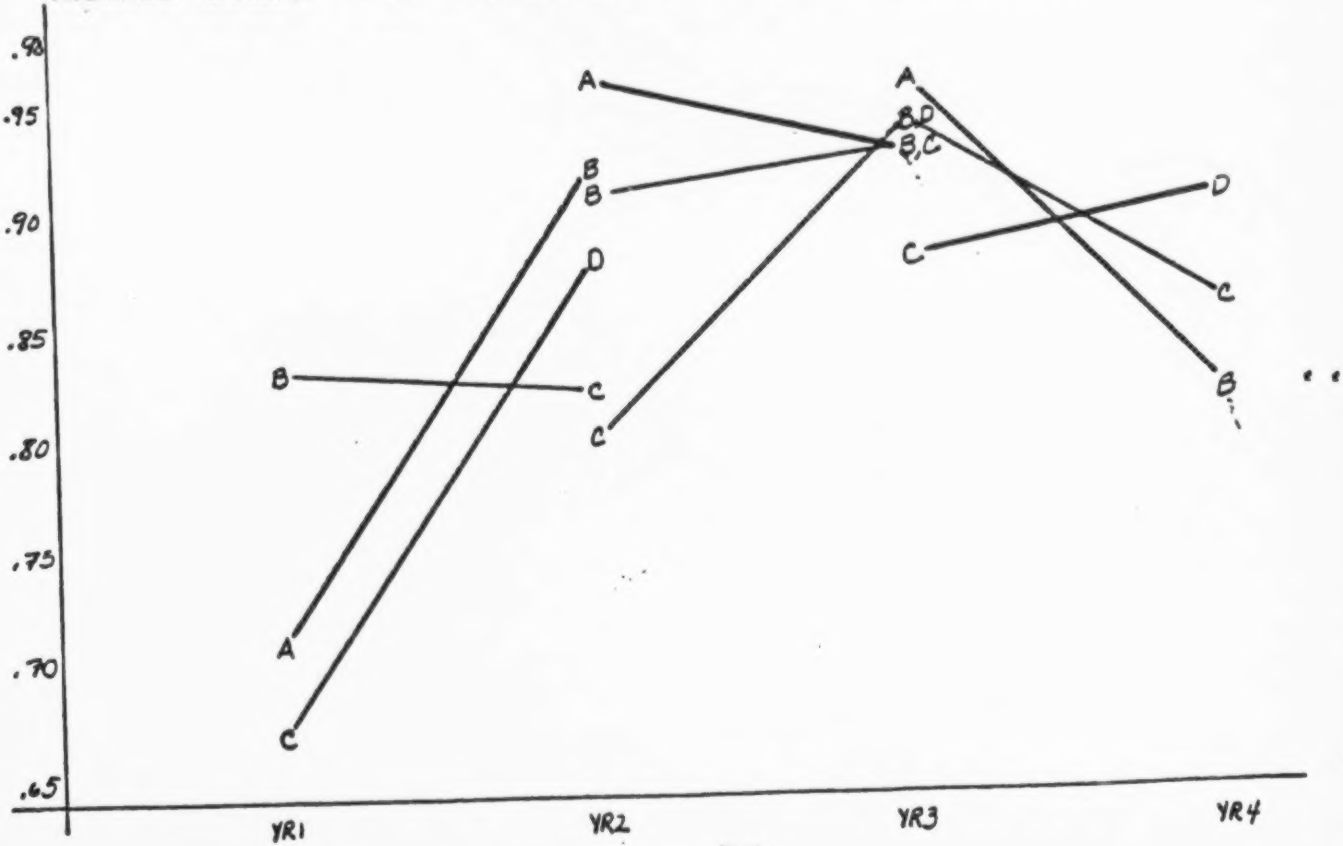


FIGURE IV. 4

AVERAGE STUDENT LEVEL ENGAGEMENT RATE IN ARITHMETIC



Three interesting results were revealed by these analyses. First, there was no substantiation of the commonly held belief that children's engagement increases as they get older. If this had been the case, there would have been a consistent pattern of increasing engagement rate from grade to grade in the same year and across time. This was not the case.

Second, the same pattern of change that was observed at the classroom level was observed at the student level. There was generally a large, statistically significant, increase in student's engagement from year 1 to year 2. There was a smaller increase from year 2 to year 3 which was statistically significant in three out of the six classes. There was a decrease in student engagement from year 3 to year 4 which was statistically significant five out of six times. These changes were more consistent in reading than in arithmetic.

Finally, the average student engagement rate was generally quite high.

Initially, it was planned to divide the entire sample into groups based on their previous year's achievement test scores to determine if there were different effects depending on a child's quartile rank. However, as will be apparent from the achievement test results reported later in the chapter, very small numbers of children scored below the first quartile making this analysis of little value. Instead, we examined the differential effects of length of time in the project. We were looking for patterns in change in engagement rate over time. These data were analyzed using t-test for dependent samples. The results of these analysis t-test for dependent samples. The results of these analyses are reported in Table IV.7. They are presented graphically in Figure IV.5 and IV.6. The patterns are

TABLE IV.7

DEPENDENT T-TESTS OF STUDENT LEVEL ENGAGEMENT BY TIME

	READING						ARITHMETIC					
	$\bar{X}$	N	$\bar{d}$	s_d	t	p	$\bar{X}$	N	$\bar{d}$	s_d	t	p
Group A												
Yr1	.76	31	-.13	.17	-4.23	<.001	.69	30	-.20	.18	-6.04	<.001
Yr2	.89						.89					
Group B												
Yr2	.89	12	-.05	.07	-2.73	<.02	85	16	-.10	-.15	-2.75	<.02
Yr3	.95						.91					
Group C												
Yr3	.95	23	.15	.17	4.36	<.001	.92	22	-.07	.21	1.46	<.20
Yr4	.80						.86					
Group D												
Yr1	.80	17	-.09	.18	-2.04	<.10	.84	16	.04	.21	.70	>.20
Yr2	.89		-.08	.10	-3.59	<.01	.81		-.16	.14	-4.49	<.001
Yr3	.97						.96					
Group E												
Yr2	.92	13	-.00	.07	-.12	>.20	.96	14	.03	.12	.93	>.20
Yr3	.92		-.01	.12	-.38	>.20	.93		.05	.15	1.16	>.20
Yr4	.93						.88					
Group F												
Yr1	.79	10	-.12	.08	-4.59	<.01	.74	9	-.18	.17	-3.13	<.02
Yr2	.91		-.02	.06	-1.29	>.20	.92		.00	.10	.07	>.20
Yr3	.93		.05	.06	2.62	<.05	.92		.06	.13	1.42	<.20
Yr4	.88						.86					

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C

FIGURE IV.5

AVERAGE STUDENT ENGAGEMENT BY TIME IN PROJECT - READING

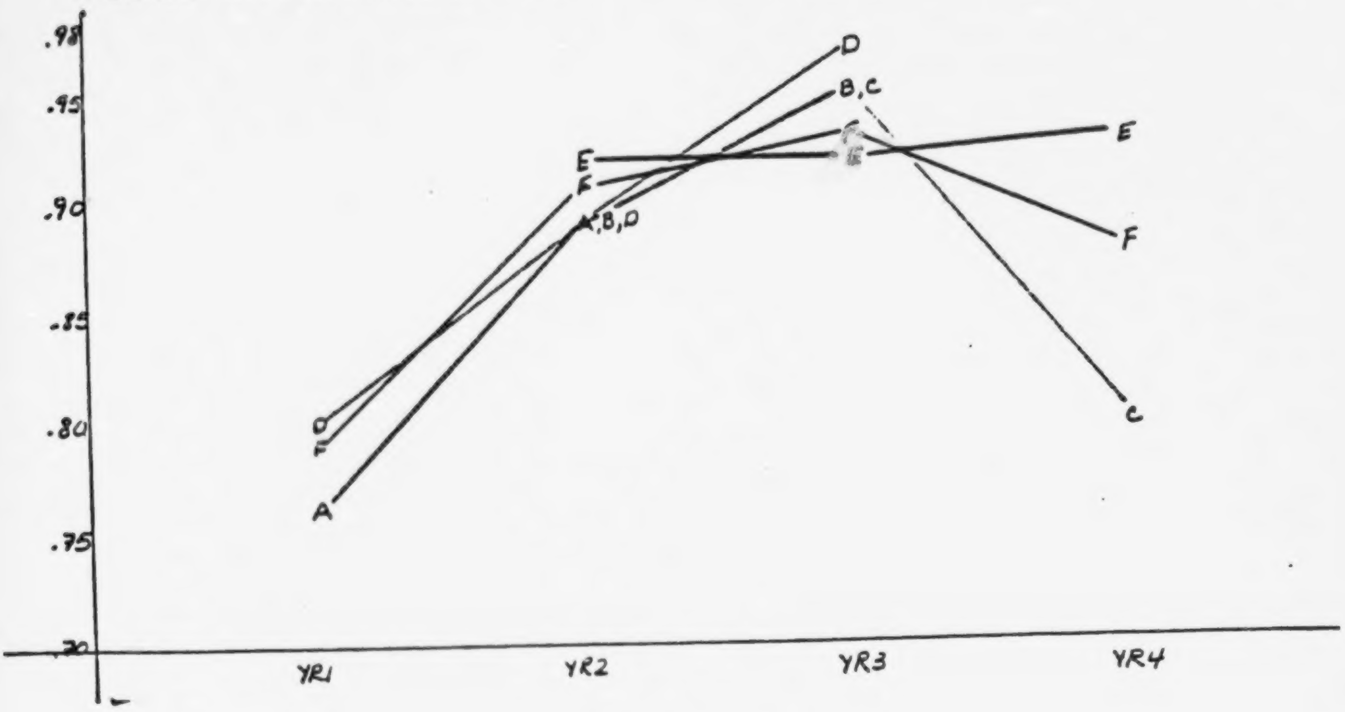
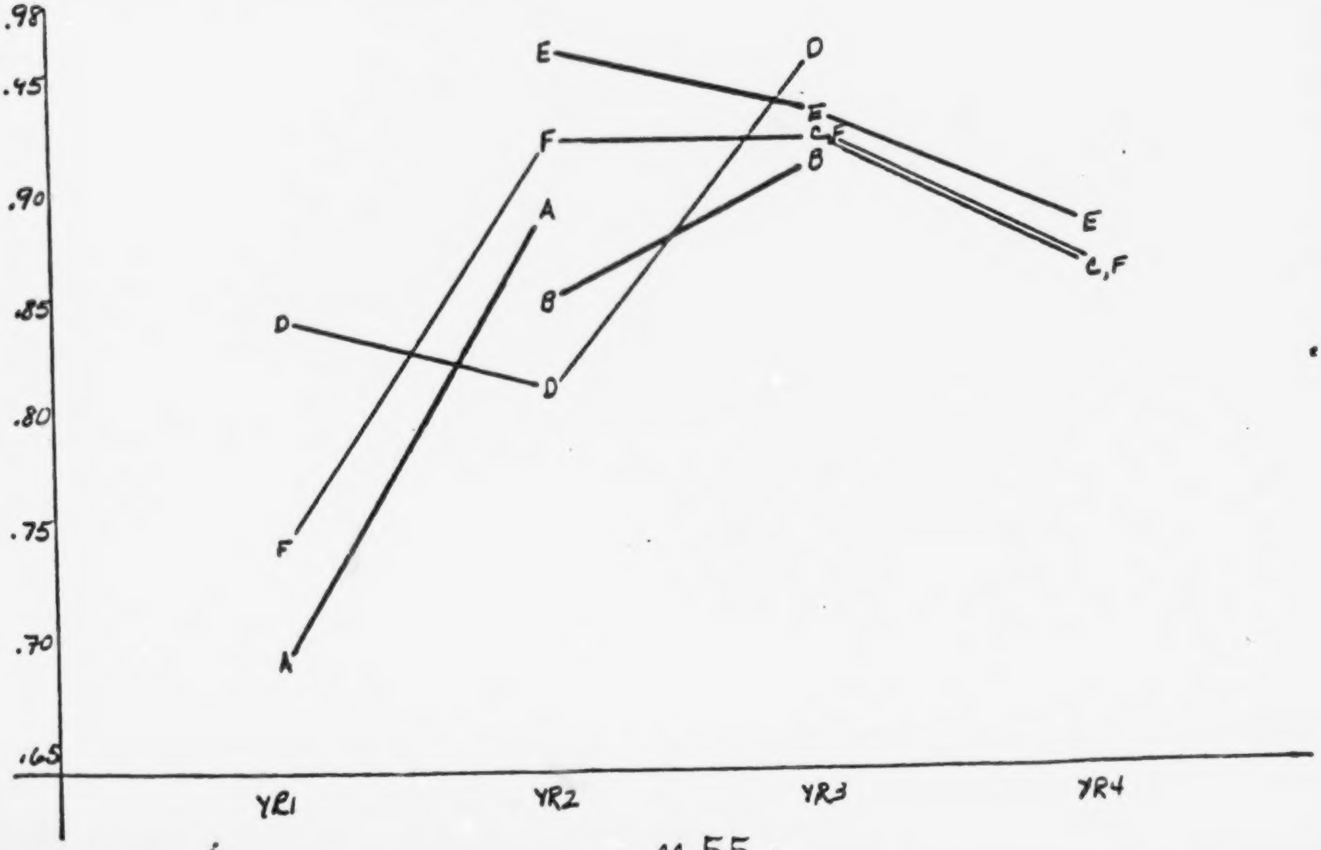


FIGURE IV.6

AVERAGE STUDENT ENGAGEMENT BY TIME IN PROJECT - ARITHMETIC



much more readily apparent in the graphs. Groups A, B and C were each in the project for two years only. Groups A and B showed increases in engagement rate in both reading and arithmetic. Groups C showed decreased in both reading and arithmetic. Groups D and E were in the project for three years. These show increases in reading across the three years and mixed patterns in arithmetic. Group F were in the project for four years. The pattern of change in engagement for this group is similar in reading and arithmetic and it reflects the pattern bound at the class level. Because there were only ten students in Group F, their engagement rates were graphed (Figure IV.7 and IV.8). These graphs make some important points more visible. First, only one student in reading and one in arithmetic demonstrated a decrease in engagement rate from year 1 to year 2. From year 2 to year 3, four students in reading and three students in arithmetic decreased engagement rate. In year 3, half of the students were reported to have 100% engagement rate. They had reached the top of the scale; they can only go down or stay the same. This may partially explain the decrease in engagement which occurred form year 3 to year 4.

Achievement Test Scores

Displayed in Table IV.3 (page 37) are the number of students per class per year, the mean Z-score and standard deviation of the Z-scores from those students in reading and arithmetic. These same data are displayed graphically in Figures IV.9 and IV.10. The same analyses that were reported for the engagement rate were completed for these scores for the same reasons. The rationale will not be repeated here. it should be emphasized that from the beginning of the project, the average class Z-scores were above .00 (50th percentile) and the standard deviations were less that 1.00. This makes this population unusual and violates the assumption that low-income children necessarily need to improve their achievement test scores.

The results of the analysis of the differences in class means from year to year using a t-test of independent samples are presented in Table IV.8. The results

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FIGURE IV.7
STUDENT ENGAGEMENT RATE ACROSS YEARS
READING

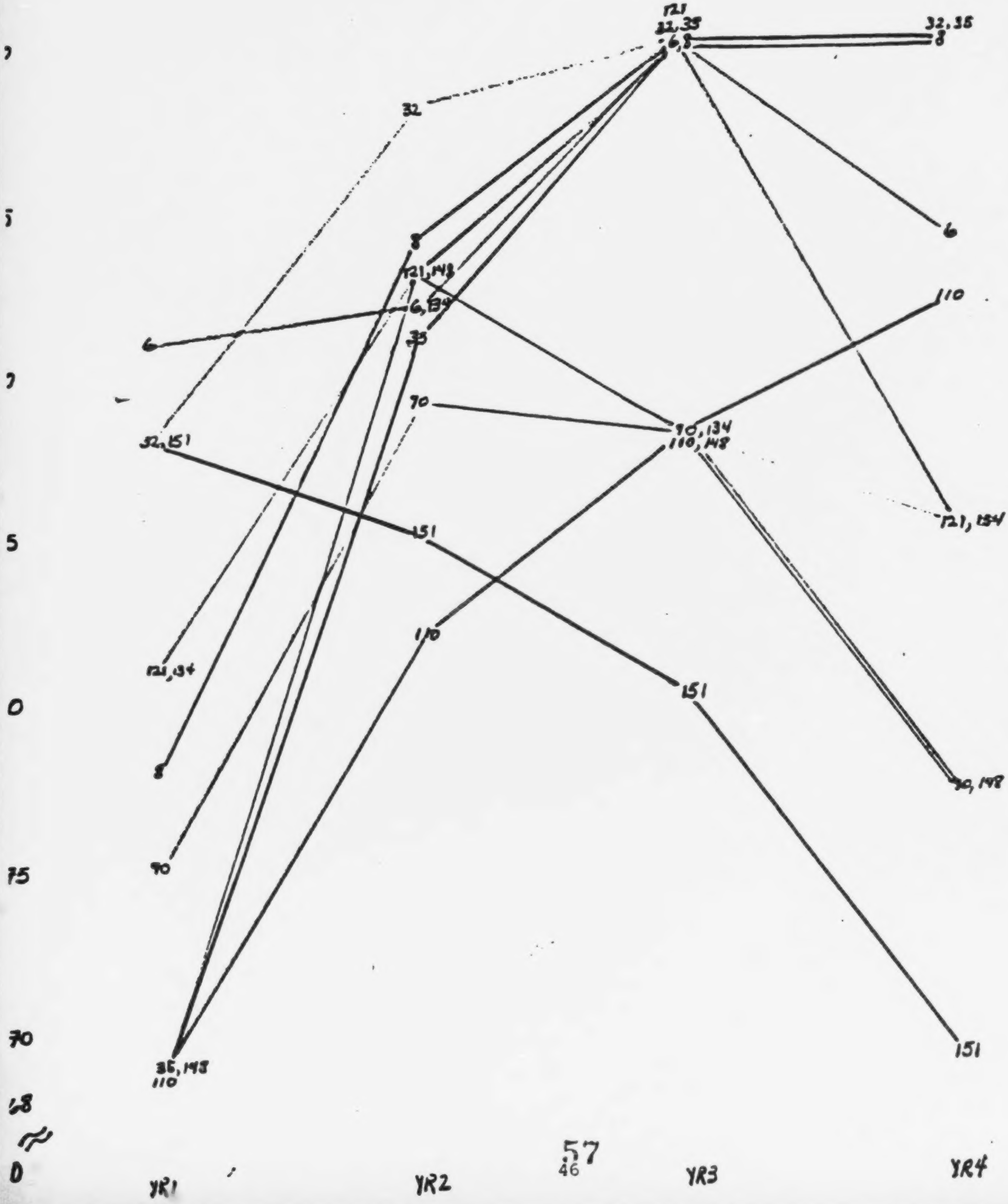

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FIGURE IV.8

STUDENT ENGAGEMENT RATE ACROSS YEARS

ARITHMETIC

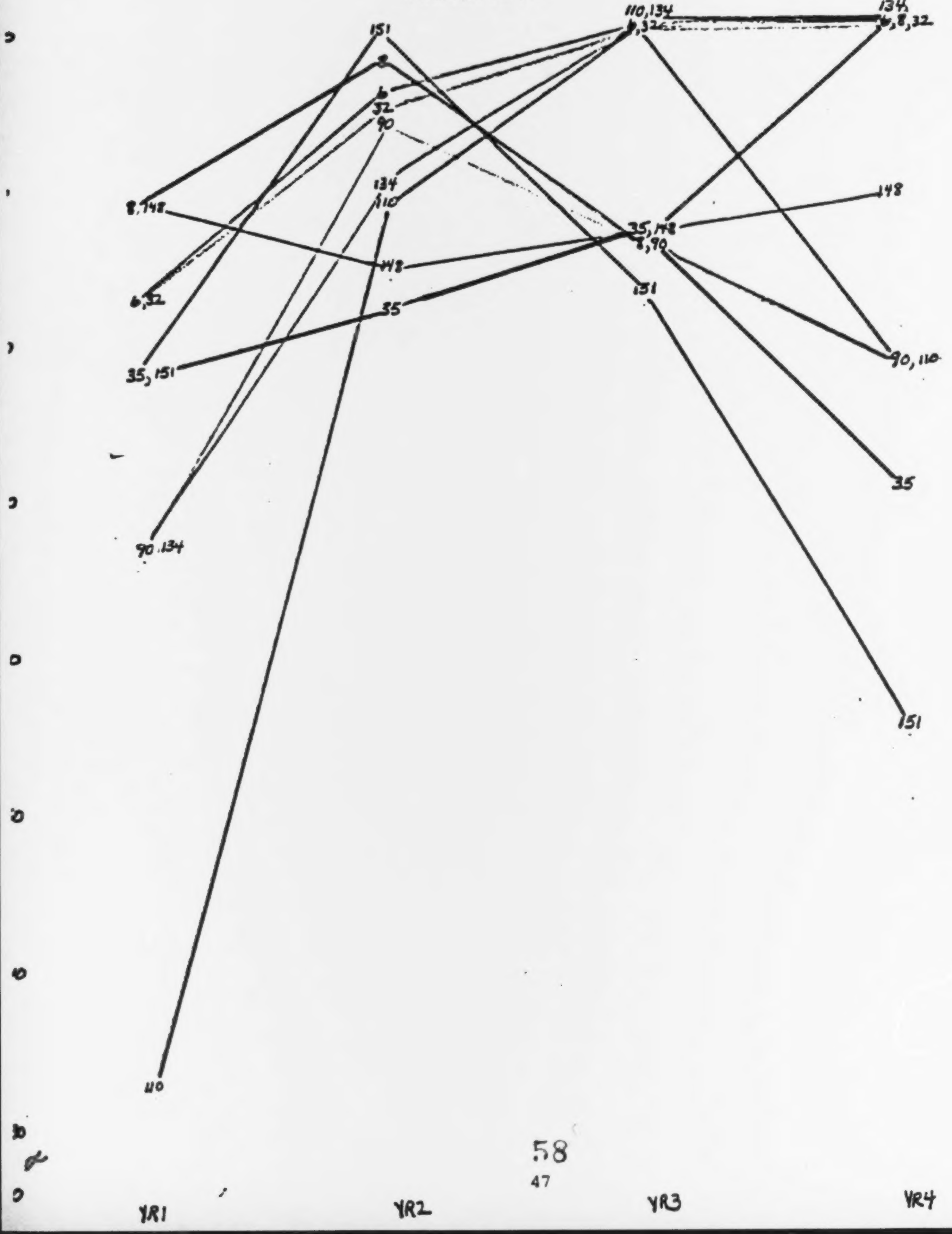


FIGURE IV.9

AVERAGE CLASS Z-SCORES IN READING

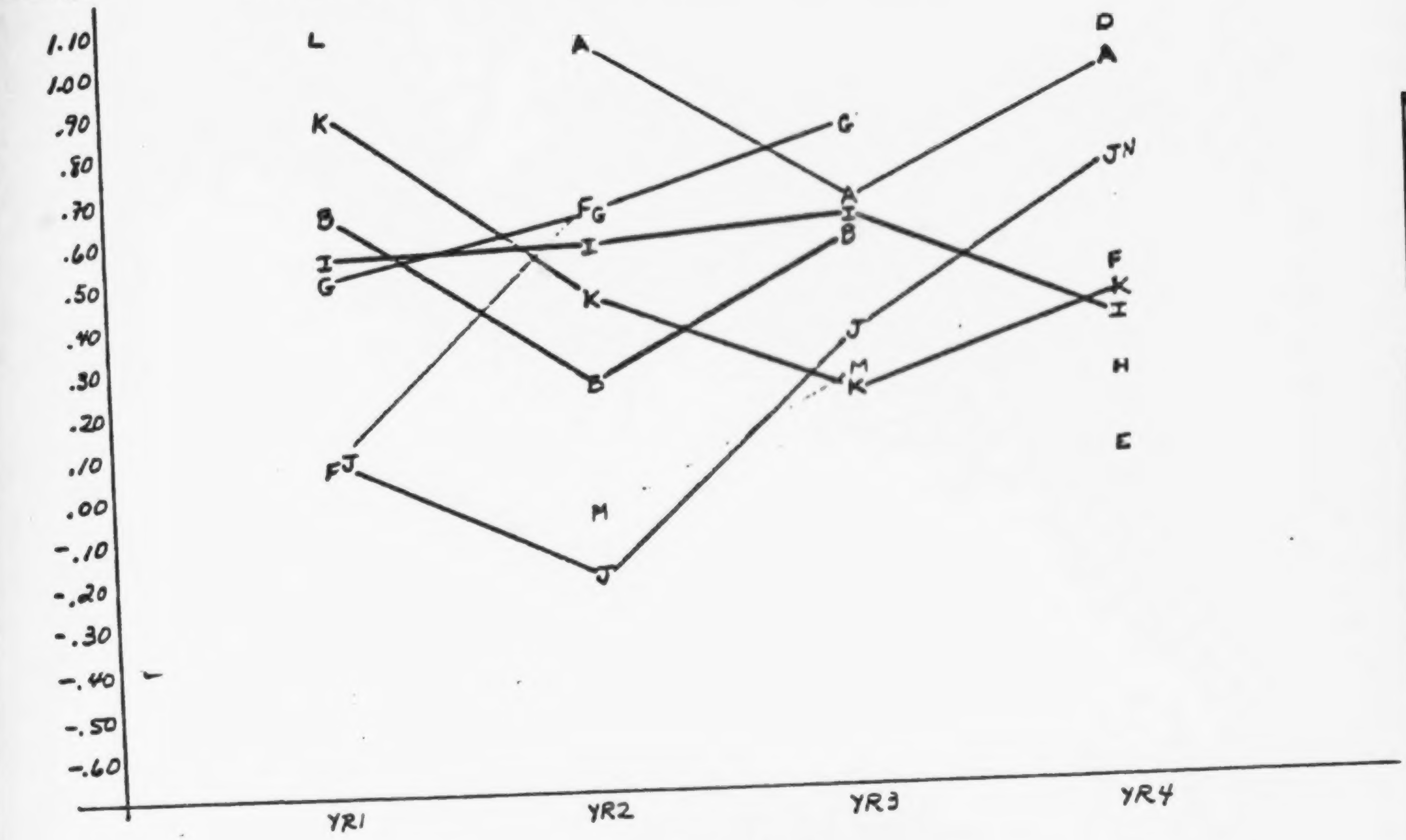


FIGURE IV.10

AVERAGE CLASS Z-SCORES IN ARITHMETIC

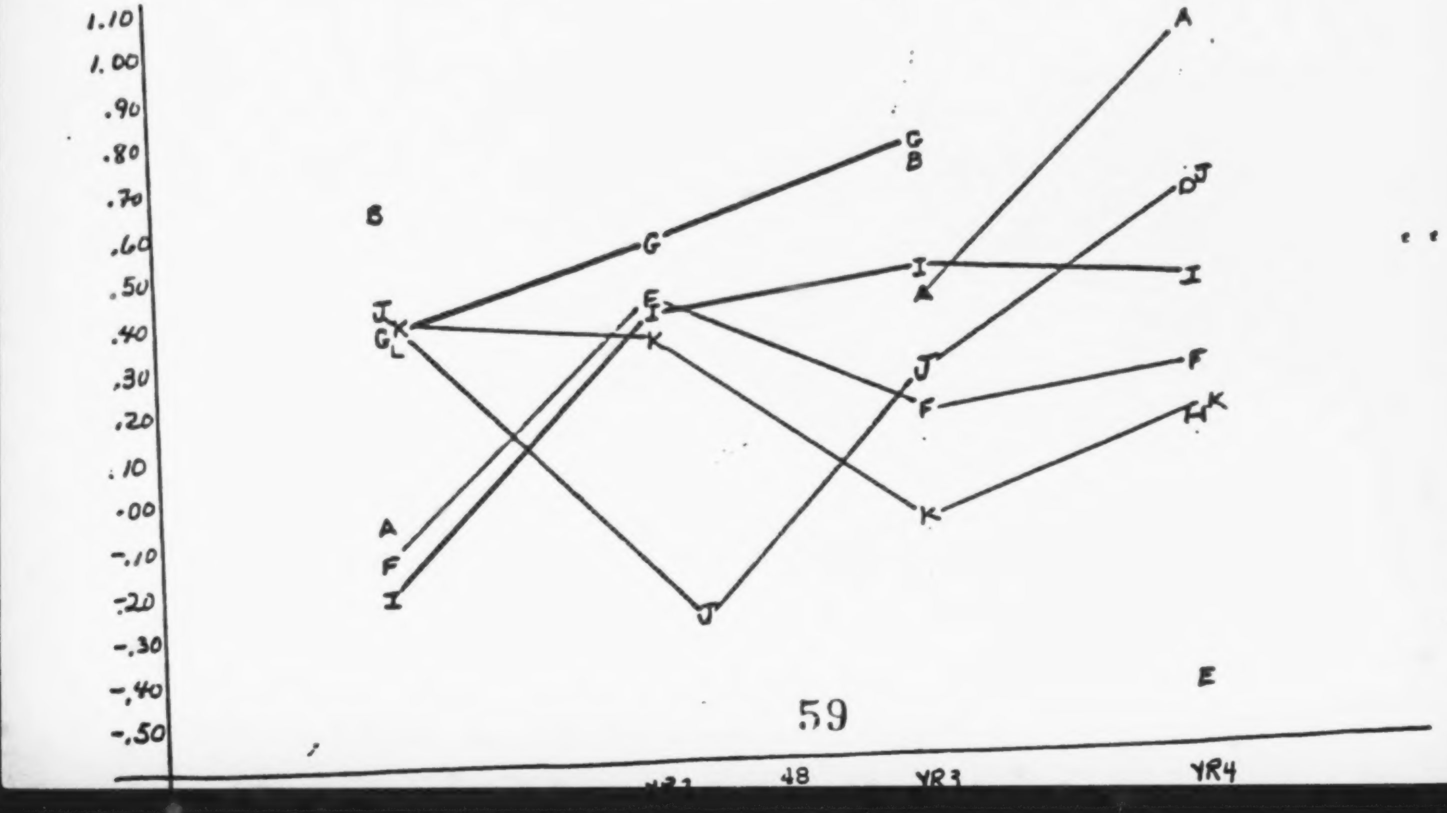


TABLE IV.8

INDEPENDENT T-TEST OF CLASS Z-SCORES

Teacher Year	READING				ARITHMETIC			
	$\overline{X}_1 - \overline{X}_2$	d_f	t	p	$\overline{X}_1 - \overline{X}_2$	df	t	p
A								
1 vs 2	--	--	--	--	--	--	--	--
2 vs 3	.39	26	1.30	>.20	--	--	--	--
3 vs 4	-.30	28	-1.00	>.20	-.63	28	-2.41	<.05
B								
1 vs 2	.40	26	1.76	<.10	--	--	--	--
2 vs 3	-.23	21	-.67	>.20	--	-	--	-
F								
1 vs 2	-.57	23	-2.05	<.10	-.56	24	-2.07	<.05
2 vs 3	--	--	--	--	.36	22	1.15	<.20
3 vs 4	--	--	--	--	-.17	24	-.88	>.20
G								
1 vs 2	-.15	27	-.64	<.20	-.20	27	-.66	<.20
2 vs 3	-.19	22	-.62	<.20	-.20	22	-.54	<.20
I								
1 vs 2	-.02	25	-.07	>.20	-.62	24	-1.63	<.20
2 vs 3	-.04	25	-.17	>.20	-.08	24	-.31	>.20
3 vs 4	.22	25	1.11	>.20	.03	25	.10	>.20
J								
1 vs 2	.28	26	1.02	>.20	.69	26	2.39	<.05
2 vs 3	-.54	27	-1.85	<.10	-.53	27	-1.65	<.20
3 vs 4	-.40	23	1.75	<.10	-.42	23	-1.20	>.20
K								
1 vs 2	.45	20	1.26	>.20	.06	20	.15	>.20
2 vs 3	.22	23	.59	>.20	.40	23	1.17	>.20
3 vs 4	-.21	25	-.58	>.20	-.23	25	-.61	>.20
M								
2 vs 3	-.32	20	-1.05	>.20	.19	20	.54	>.20

of the t-test for dependent samples are presented in Table IV.9. The results of

TABLE IV.9

DEPENDENT T-TEST OF CLASS Z-SCORES

	N	$\overline{X}_1$	$\overline{X}_2$	$\overline{d}$	s_d	t	p
1982 vs 1982-83							
Reading	6	.46	.39	.07	.39	.41	>.20
Arithmetic	6	.25	.36	-.11	.23	-.55	>.20
1982-83 vs 1983-84							
Reading	7	.38	.49	-.10	.32	-.84	>.20
Arithmetic	7	.29	.27	.01	.11	.10	>.20
1983-84 vs 1984-85							
Reading	4	.46	.63	-.17	.27	-1.26	>.20
Arithmetic	5	.23	.51	-.28	.06	-2.52	<.10

these analyses indicate that any change in class level achievement from year to year are more apparent than real. Only 3 out of the 37 independent t-tests are statistically significant. These changes could just as easily be attributed to measurement error or regression as to the treatment. In addition, there is no logically explainable pattern of decreases or increases. This apparently random change would be what would be predicted if there were no intervention.

The results of the analysis of student level changes are displayed in Table IV.10 and Figures IV.11 and IV.12.

TABLE IV.10

DEPENDENT T-TEST OF STUDENT ACHIEVEMENT

READING	N	y_1	y_2	d	s_d	t	p
Grade 1 - 2							
Yr1 - Yr2	12	.54	.65	-.11	.84	-.44	>.20
Yr2 - Yr3	10	.42	.83	-.41	.70	-1.86	<.10
Yr3 - Yr4	21	.69	.38	.31	.44	3.19	<.01
Grade 2 - 3							
Yr1 - Yr2	22	.25	.07	.17	.63	1.30	>.20
Yr2 - Yr3	19	.70	.45	.25	.44	2.49	<.05
Yr3 - Yr4	09	.85	.69	.16	.56	.85	>.20
Grade 3 - 4							
Yr1 - Yr2	21	.35	.25	.10	.64	.70	>.20
Yr2 - Yr3	16	.23	.39	-.16	.37	-1.68	<.20
Yr3 - Yr4	22	.39	.53	-.15	.78	-.90	>.20
ARITHMETIC							
Grade 1 -2							
Yr1 - Yr2	19	.42	.65	-.23	.74	-1.36	>.20
Yr2 - Yr3	10	.72	.76	-.04	.39	-.33	>.20
Yr3 - Yr4	21	.63	.26	.37	.53	3.20	<.01
Grade 2 - 3							
Yr1 - Yr2	21	.11	-.03	.14	.71	.92	>.20
Yr2 - Yr3	19	.61	.41	.20	.53	1.68	<.20
Yr3 - Yr4	19	.53	.55	-.02	.59	-.16	>.20
Grade 3 - 4							
Yr1 - Yr2	21	.09	.13	-.04	.88	-.21	>.20
Yr2 - Yr3	15	.04	-.05	.09	.38	.88	>.20
Yr3 - Yr4	22	.22	-.02	.24	.51	2.19	<.05

The only four t-test out the 18 in the table which are statistically significant are decreases. It should also be noted that these decreases occurred when the first year was particularly high (.69, .70, .63). This may be partly explained by regression toward the mean, although it certainly doesn't explain the decrease completely. It is also curious that in year 2 in reading, the achievement scores are quite different for children who have year 2 data (.07) and children who have year 4 data (.23). This same difference occurs in year 3 in arithmetic for children who have grade 2 and grade 3 data (.41) and those who have grade 3 and grade 4 data (.22). It indicates that the average Z-score is very sensitive to differences in which students are included in the analysis.

In Figures IV.13 - IV.18 (at the end of the chapter) the scores of individual students across time are graphed. These were not analyzed statistically because of the lack of significant results in the other analyses. An examination of these results show that, although a student's Z-score may vary greatly from year to year, over longer periods of time the average differences are very small.

FIGURE IV. 11

AVERAGE STUDENT LEVEL ACHIEVEMENT IN READING

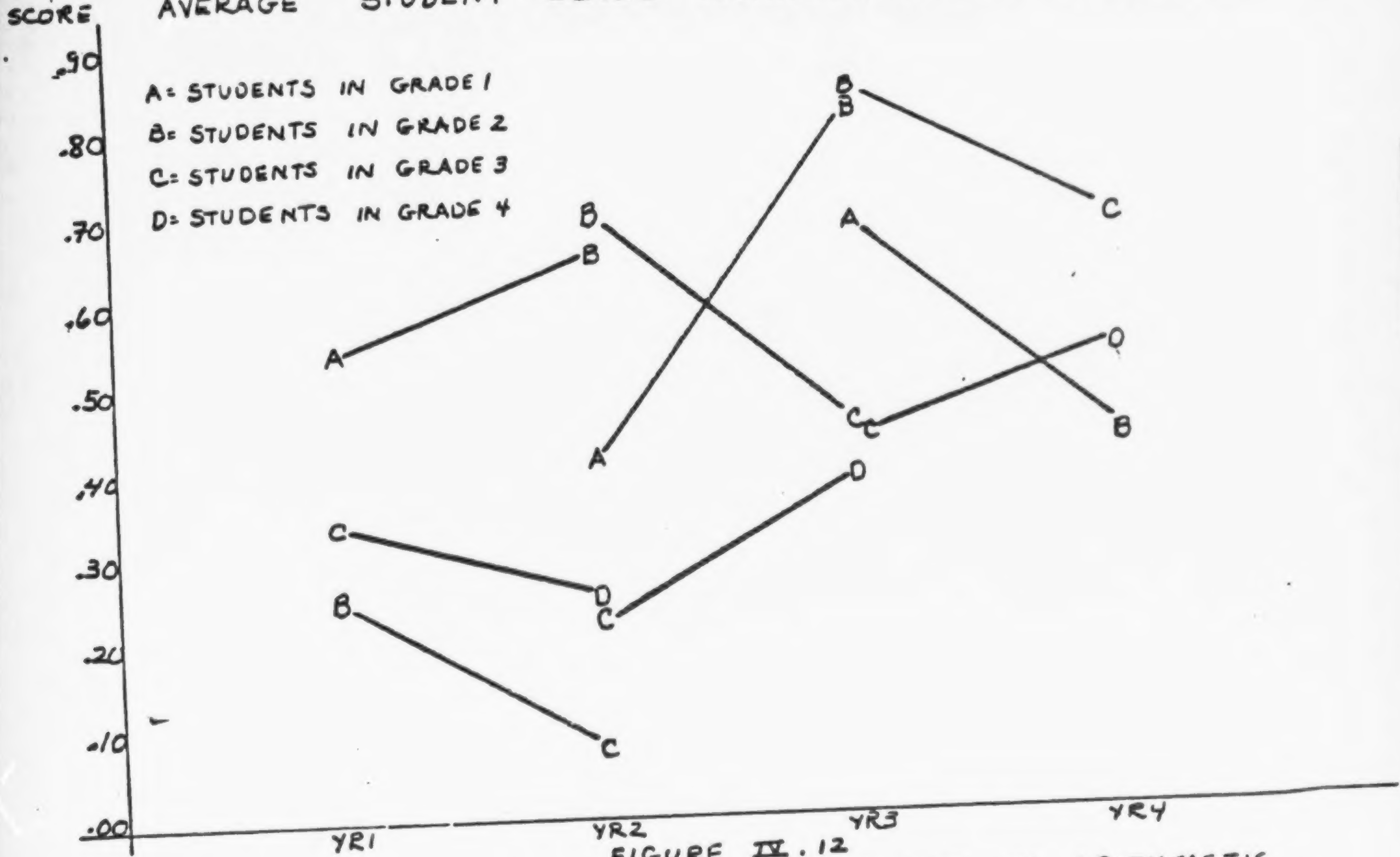


FIGURE IV. 12

AVERAGE STUDENT LEVEL ACHIEVEMENT IN ARITHMETIC

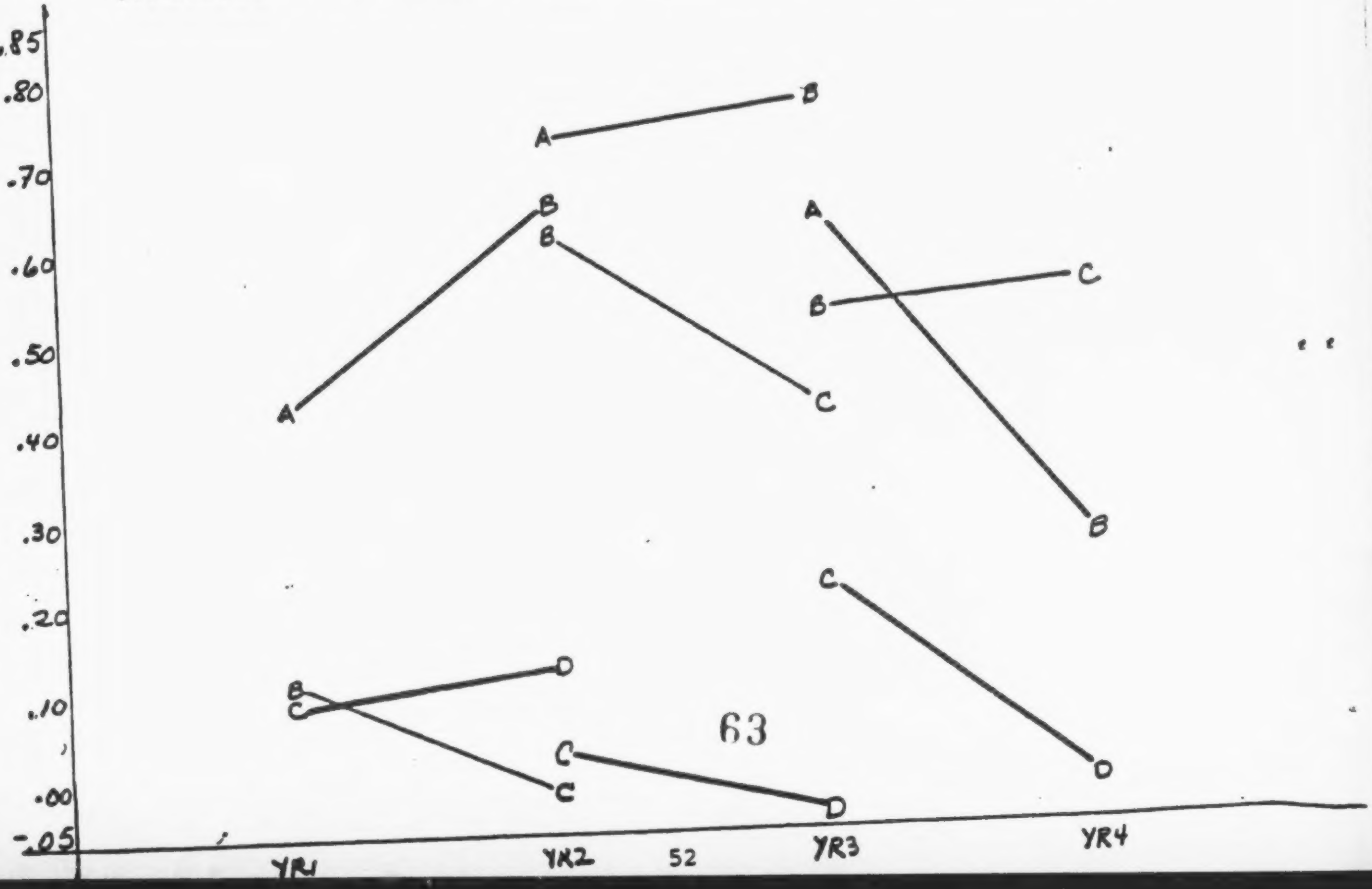
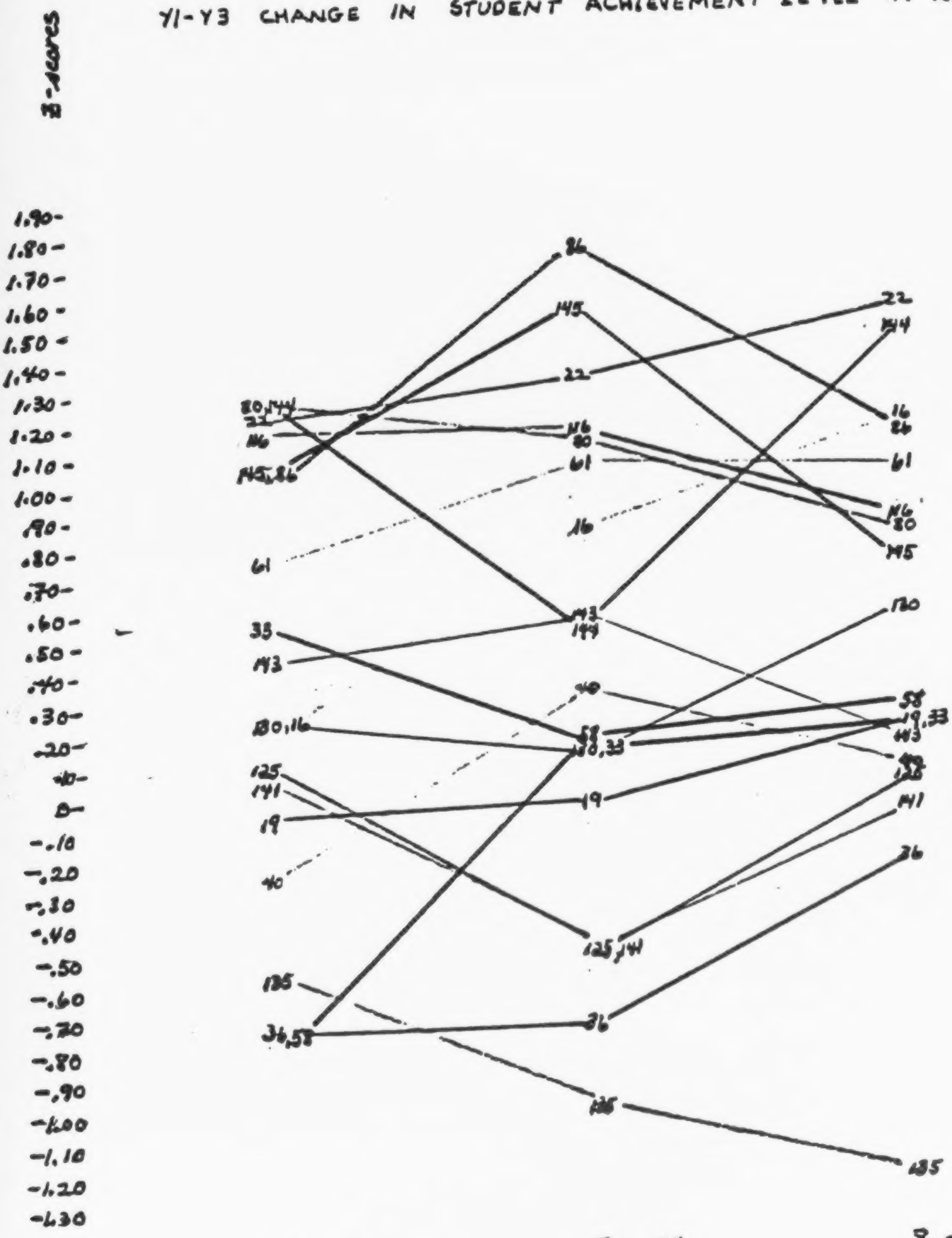


FIGURE IV. 13

Y1-Y3 CHANGE IN STUDENT ACHIEVEMENT LEVEL IN READING



$\bar{x}_1 = .39$

$\bar{x}_2 = .44$

$\bar{x}_3 = .485$

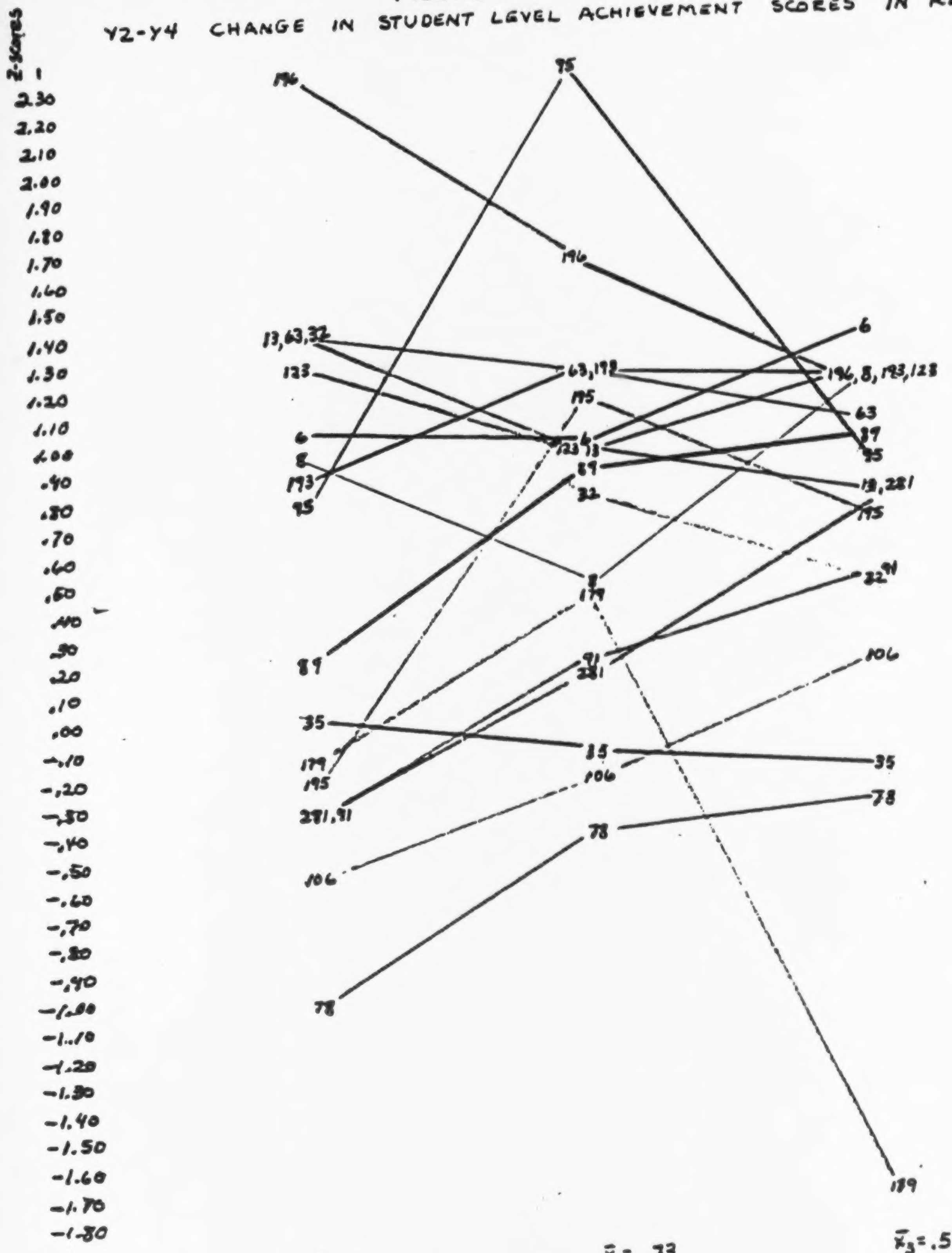
$\bar{d}_1 = -.05$

$\bar{d}_2 = .05$

$\bar{d}_{1-2} = -.095$

FIGURE IV.14

Y2-Y4 CHANGE IN STUDENT LEVEL ACHIEVEMENT SCORES IN READING



$\bar{x}_1 = .53$

$\bar{x}_2 = .73$

$\bar{x}_3 = .57$

$\bar{d}_1 = -.20$

$\bar{d}_2 = +.16$

$\bar{d}_{1-2} = -.0$

1984

1985

FIGURE IV.15

YR1-YR4 CHANGE IN STUDENT LEVEL ACHIEVEMENT IN READING

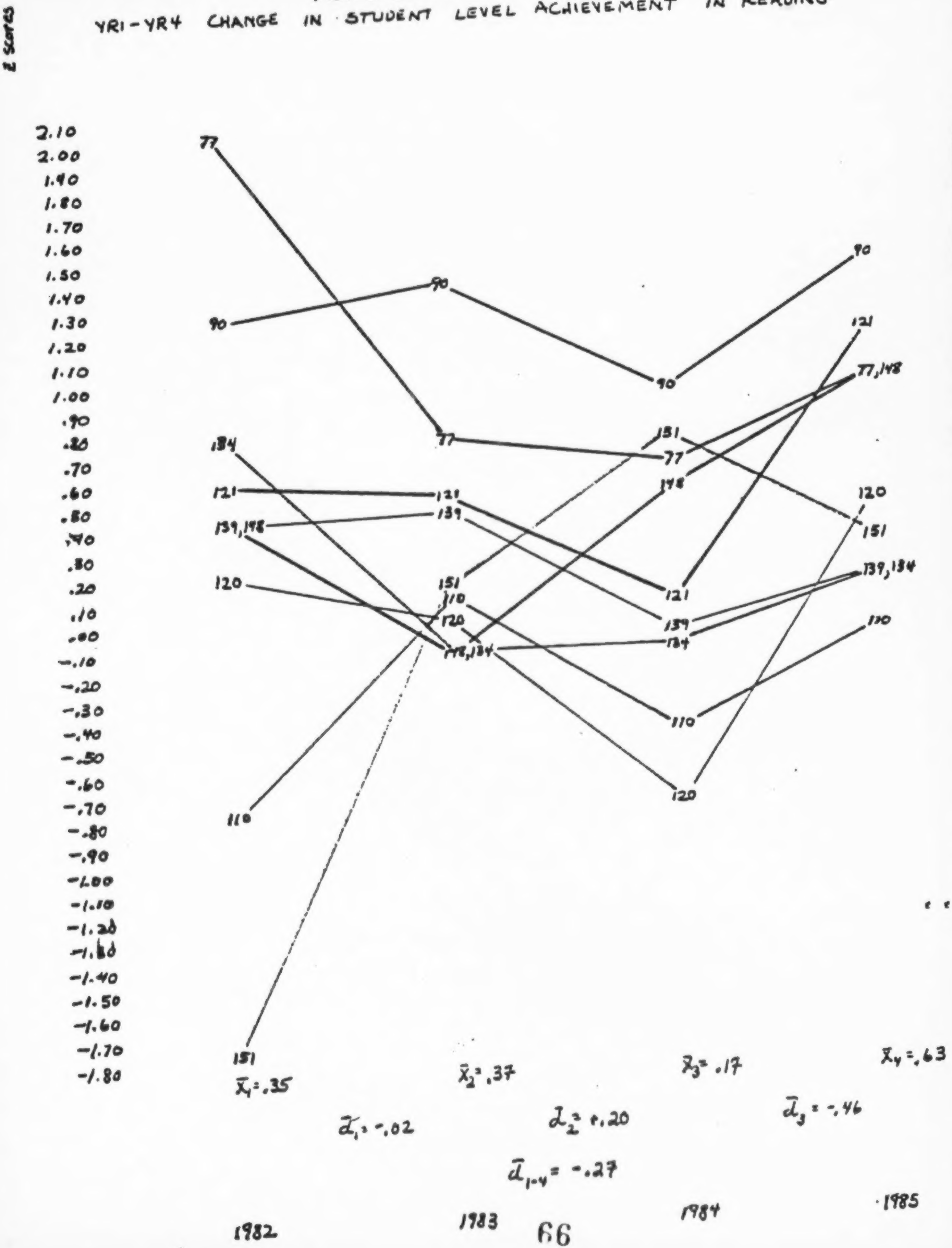


FIGURE IV.16

Y1-Y3 CHANGE IN STUDENT ACHIEVEMENT LEVEL SCORES IN ARITHMETIC

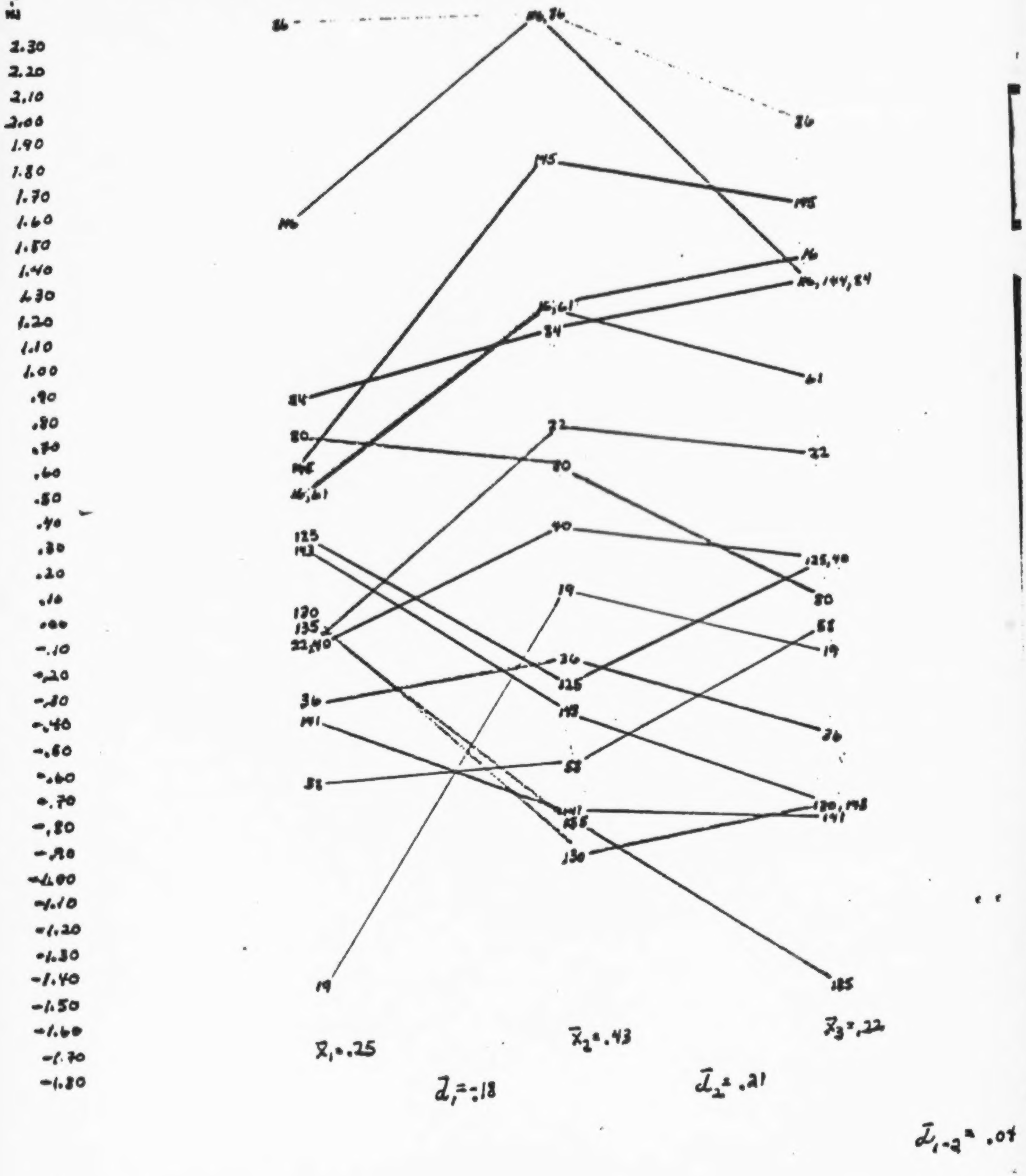


FIGURE IV. 17
Y2 - Y4 CHANGE IN STUDENT LEVEL ACHIEVEMENT IN ARITHMETIC

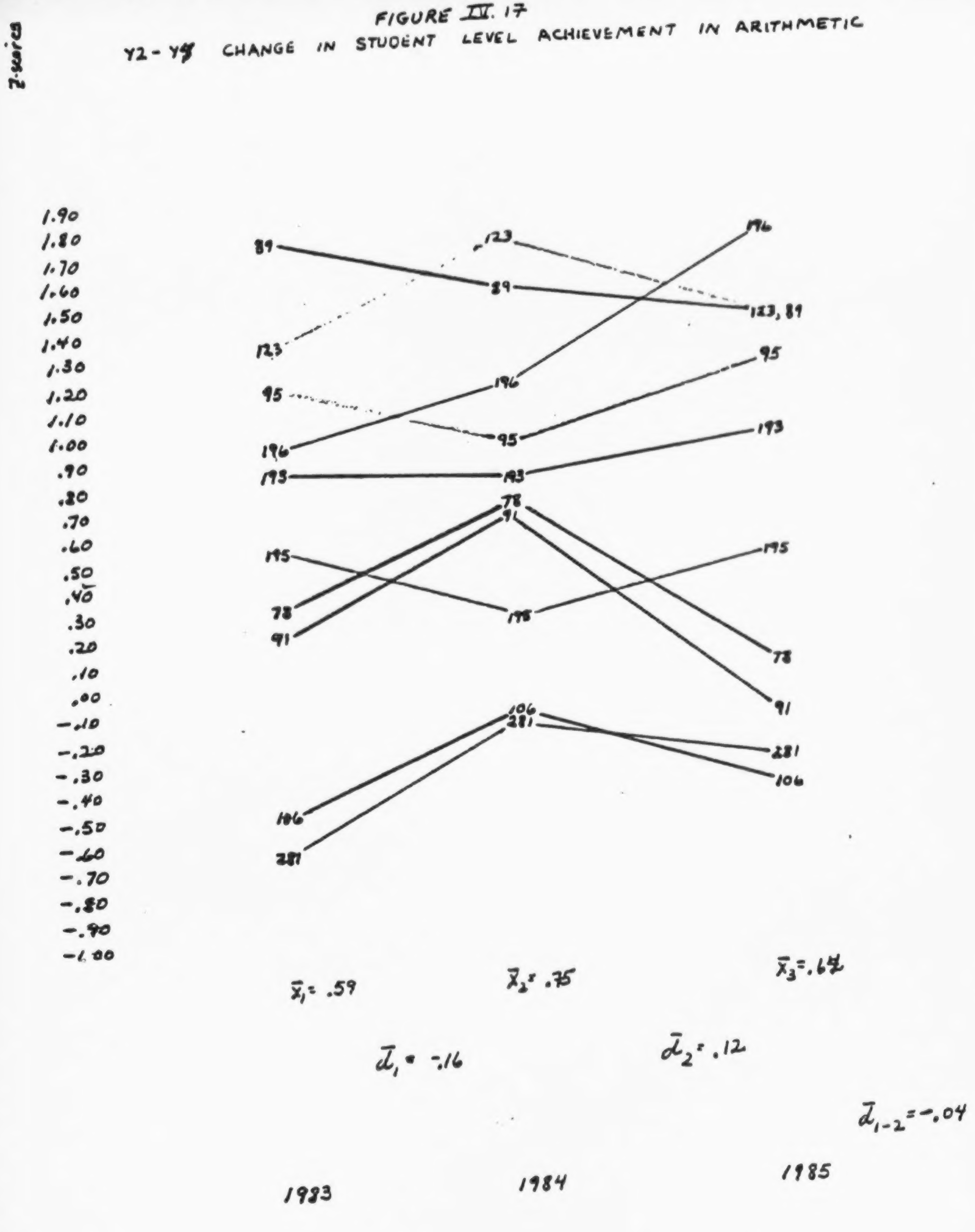
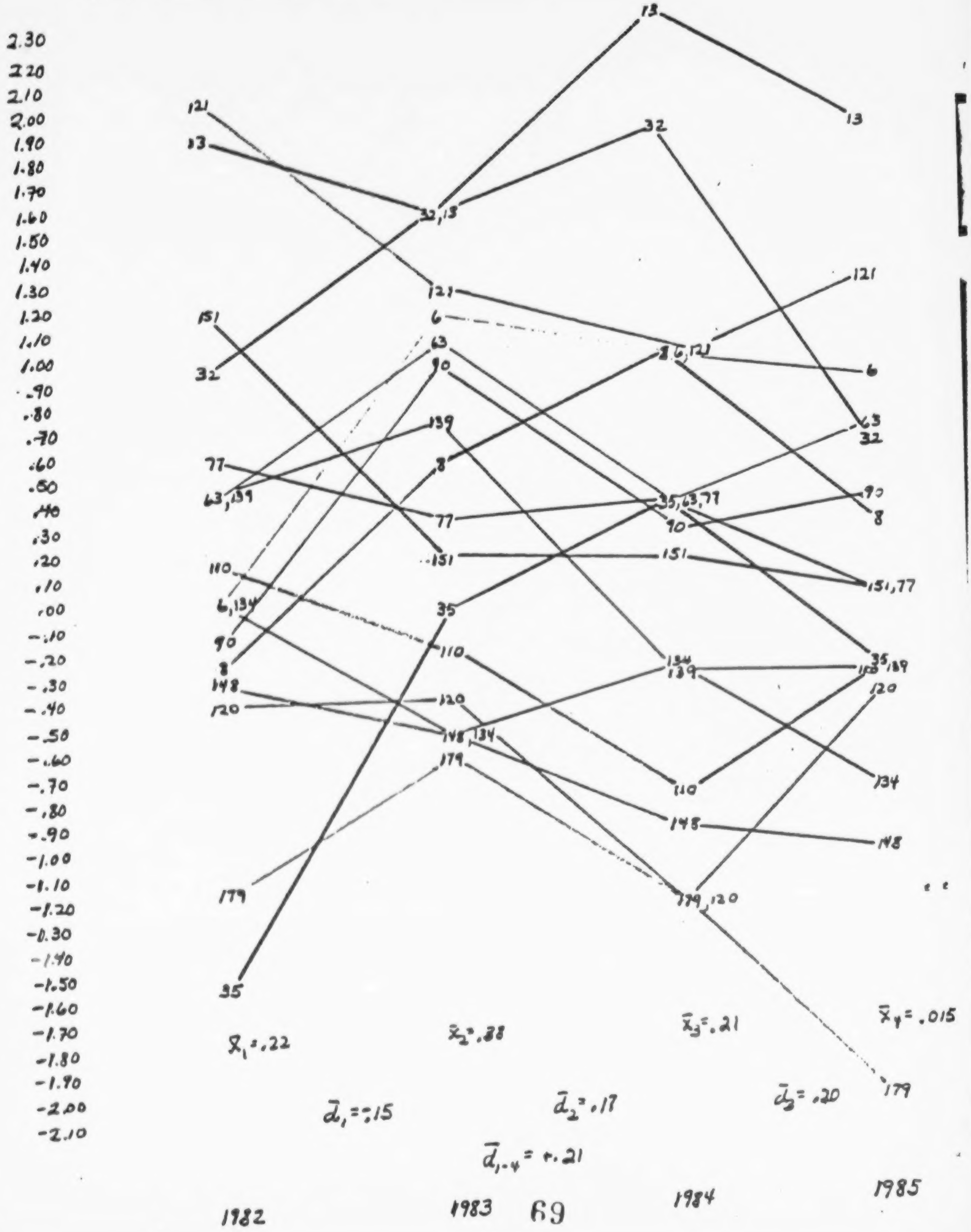


FIGURE IV.18

Y1-Y4 CHANGE IN STUDENT LEVEL ACHIEVEMENT IN ARITHMETIC



Relationship Between Engagement Rate and Achievement

The final question which was examined was whether there was a positive relationship between engagement rate and achievement test scores. Each analysis included only those students for whom we had complete data (engagement rate and achievement test scores) for two consecutive years. It is well established that the best predictor of achievement test scores is past achievement. The correlation of students' achievement in two consecutive years provides a criterion by which to judge the strength of the relationship between engagement rate and achievement test scores. Only student level analyses were done because, although engagement rate appears to be a group level phenomenon, achievement scores seem to be dependent on the characteristics of each individual. The results of this analysis appear in Table IV.11.

TABLE IV.11

CORRELATIONS OF ENGAGEMENT RATE AND ACHIEVEMENT

	Reading			Arithmetic		
	N	ER with Z	Z with Z	N	ER with Z	Z with Z
Yr 1 Yr 2	49	r=.28 p<.05 r=.46 p<.01	r=.63 p<.01	53	r=.11 p>.10 r=.54 p<.01	r=.54 p<.01
Yr 2 Yr 3	34	r=.53 p<.01 r=.07 p>.10	r=.69 p<.01	33	r=.47 p<.01 r=.35 p<.05	r=.90 p<.01
Yr 3 Yr 4	35	r=.10 p>.01 r=.12 p>.10	r=.53 p<.01	43	r=.09 p>.10 r=.37 p<.02	r=63 p<.01

*ER = Engagement Rate

*Z = Achievement Test Z-scores

Several observations were made about these relationships. First, the correlations were somewhat unstable; that is, they varied depending on which students' scores were included in the analysis. This is particularly evident in the year 3 correlations of engagement rate and achievement test Z-scores in arithmetic. The correlation is .35 for students who had year 2 and year 3 data and .09 for students who had year 3 and year 4 data. Second, **the largest correlations of engagement rates and achievement test scores occurred in year 2 in both reading and arithmetic.** This is also the year when the largest increases in engagement rate occurred. Third, **the largest correlations of engagement rates and achievement are as large as the correlations between achievement test scores from one year to the next.**

Because of the small size of the ER with Z-score correlations, scatterplots were drawn for several of the correlations. (See Figures IV.19 - IV.26 in Appendix B.) These scatterplots were used to examine the possibility that the correlations were attenuated by either curvilinearity or restriction of range. No curvilinearity was observed in any of the scatterplots. However, in the year 3 data, it is clear that the engagement rate with Z-score correlation is attenuated due to a ceiling effect (noted previously) in the engagement rate data. As can be seen in Figure IV.22, more than half the students were reported as 100% engaged. This limits the usefulness of the engagement rate in explaining the variations in achievement test scores.

CONCLUSIONS

What Were The Effects Of The Inservice On Students Engagement Rate?

It is fairly certain that student engagement rate did increase during the first year that inservice was provided to the teachers. There seems to be no compelling explanation for this increase other than the existence of the inservice. Assuming that the pattern of engagement which appeared in the data is real, then the effects of the inservice program on engagement rate were "used up" after the first year. Their may be because teachers felt that the results of maintaining an extremely high level of engagement was not worth the effort it required or other costs associated with it. It may also be because the year 3 engagement rates were spuriously high. Year 3 engagement rates were collected by a different observer than the other years. Teachers expressed concern about the validity of these observations. Although the other year's engagement rates are also relatively high, this is probably due to the definition of engagement established from the beginning of the project.

What Was The Effect Of The Project On Student Achievement?

Achievement test scores did vary from year to year during the project. However, the variation in most cases was not large enough to be important and there was no identifiable patterns in these variations. Therefore, the inservice appears to have had no observable effect on achievement test scores.

It must be noted that improving achievement test scores was never a legitimate goal for this project. Average achievement scores were consistency above the expected mean of .00, even before the project. No concern about raising achievement test scores was expressed by the district's superintendents, by the teachers by the parents of the children in these schools, or by the trainers. It may also be that the children learned things that were not measured by achievement tests.

What Was The Relationship Between Engagement Rate And Achievement?

It does not seem to be the case that raising engagement rate necessarily raises achievement test scores. The increases in engagement rate at the class level are not accompanied by increases in average Z-scores. This in not conclusive because the students for whom there is complete engagement rate data are not the same students for whom there is complete achievement test data.

At the student level there is a positive correlation between achievement Z-scores and engagement rate, ranging from weak to moderate in strength. It is never as strong, however, as the correlation between the present and previous year's achievement test Z-scores. It appears that some additional qualifiers must be considered when determining the relationship between engagement rate and achievement. These might include the quality of the engagement and the relationship of the curriculum to what is being tested.

In the end, it seems we can keep the children on task, but we can't necessarily make them learn better.

CHAPTER V

SPECIAL EFFECTS

INTRODUCTION

Included in this chapter are three special analyses which were done specifically for the Cotopaxi/Westcliffe Project. First, is a comparison of engagement rate for different periods during the day, completed because the Cotopaxi/Westcliffe Schools were on a four-day week. Second, is an analysis of the stability of engagement rate, completed by Greg Camilli, Ph.D. Third, is the distribution of "student activity study", completed by Shelly Karp.

A COMPARISON OF ENGAGEMENT RATE FOR DIFFERENT PERIODS DURING THE SCHOOL DAY.

Because both Cotopaxi and Westcliffe have four day school weeks and longer school days, an analysis was planned to determine if this had any effect on engagement rate. The school day was divided into five equal time periods, and average student engagement rate was calculated for each period. The averages were compared using a repeated measures ANOVA. The results of that analysis are reported in Table V.1.

TABLE V.1

Comparison of Engagement Rates Across Time Period

	1981-82		1982-83		1983-84			
	x	SD	x	SD	x	SD	F	P
Period 1	84.52	8.75	90.40	1.89	95.50	3.56	12.20	.0006
Period 2	80.96	9.27	88.51	4.59	93.94	1.55	13.84	.0003
Period 3	77.11	12.88	90.35	3.84	93.89	4.25	14.92	.0002
Period 4	86.00	10.66	87.94	5.51	93.78	4.69	3.26	.06
Period 5	87.48	5.20	91.19	3.42	94.61	5.58	4.44	.03
F	3.06		1.33		.28			
P	.03		.28		.89			

The only difference among the engagement rates for the five daily periods occurred during year 1. However, this disappeared as engagement rates increased. There is no evidence that a four day school week or longer school days had a negative effect on engagement rates. The trend of increasing engagement rates from year 1 to year 3 was consistent across all five daily periods.

AN INVESTIGATION OF THE STABILITY OF TEACHER ENGAGEMENT RATES

The purpose of this research was to establish how stable teacher engagement rates are over the course of a school year. This comprises two subordinate questions. First, how stable is the rate of an individual teacher? And second, how stable are teachers relative to one another? The second question is one that is addressed by classical reliability theory in terms of the formulation "how stable is the rank order of teachers over occasions." Teacher stability is an important prerequisite for discovering teacher-student interactions, or process-product relationships. Obviously, if measured teacher behaviors are highly irregular, then there is little likelihood of these behaviors correlating to any significant degree with student outcomes.

If teachers are to be represented with any average "engagement rate" scores, these scores must be relatively consistent over time (Ragosa, Floden & Willett, 1984). Otherwise, an average score is not adequately interpretable. Inconsistency may take the form of upward of downward trends over time. Thus, a model for teacher stability must be able to account for the lawful adaptability of teachers to classroom circumstances (McGaw, Wardop & Bunda, 1972). In addition, some idea must be formulated as to the important facets of classrooms circumstances. For example, subject area is an obviously important facet; but other important, less obvious facets exist. Instances of the latter are occasion variance in the form of: time of day, day of week, proximity to holidays, and the like. An even less obvious facet may be the ordering of subjects, and the length of time each is taught, during a particular day.

If individual teachers show consistent behaviors over time which maintain an absolute level (that is, the absence of time trends), then the individual differences among teachers will be stable over time. This means that in general, a given teacher will maintain his rank order among all teachers from occasion to occasion. However, it is possible an individual teacher may show consistency, yet his rank order may vary drastically across occasions. It is also possible that teachers may all show consistent, but different trends, and yet the rank ordering remains relatively constant. Therefore, both questions are important to examine, and both give unique types of information.

In this report, tentative answers are provided to these two questions; however, certain limitations must be kept in mind. The analytic sample for this study consisted of eight teachers from two school districts. Thus, the results below are based on an extremely small sample size. Second, the two districts were not chosen to be representative of a larger set of districts and are, in fact, highly unique. Third and finally, the data were not collected in a fashion that permitted a powerful analysis. Several reasons contributed to this and are elaborated next.

The data were collected from each of eight teachers on eight different occasions during the school year. However, the occasions differed across teachers. For example, the second visit for one teacher may have occurred in September but for another teacher, it may have occurred in October. There was no satisfactory way to control for this variation. On each occasion for a given teacher, checks or "sweeps" were taken every five minutes for the duration of a class. Each child was noted as either "engage," that is, involved in the formal classroom activity, or "not engaged." The number of children varied from teacher-to-teacher; and within a particular teacher, from occasion-to-occasion and sweep-to-sweep. There was also no satisfactory way to control for this variation. Sometimes a regular class was observed, sometimes a class abbreviated by an assembly, and sometimes school-wide testing.

The result of these nuisance sources of variation are likely to increase the amount of error variance in teacher stability estimates. In this case, the estimates of stability that are derived are likely to underestimate the true stability. However, if the results of this study are applied in a manner that is similar to that in which the data were collected, then the estimates of stability are indeed lower. When sources of error are purposefully ignored, the sources are legitimately incorporated into error variance.

METHOD

Engagement rate data were collected from 8 teachers on each of 8 occasions during the school year. In essence, an observer noted for each 5 minute interval which children in the classroom were "engaged" and weren't. All data were recorded and filed. Due to design problems noted above, the data were compressed into two 8x8 matrices (for teachers and occasions), one for reading and one for math. (Reading and math were considered to be the main subject for any sweep if they appeared to be taught singly or in combination with other subjects. However, if the subject within a sweep was listed as Reading/Math, the sweep was ignored.)

For both 8x8 matrices the main entry was the average percentage engaged, across sweeps. A secondary entry was computed as the standard deviation of engagement proportions across sweeps. The latter variable indicates individual teacher stability, and a comparison of this measure across teachers is informative of relative stability. Several problems appeared at this point: some teachers either did not teach reading or math on a particular occasion, and one teacher was replaced by a substitute on one occasion. With eight observations, we could not afford to lose any due to unavailable data and the following strategy was adopted. For the substitute teacher, the average of the regular teacher was substituted. For missing data on an occasion, the average of the preceding and following occasions was substituted.

The actual analysis included two separate strategies. First, a traditional reliability analysis was done. In this case, an analysis of variance is performed on the teachers-by-occasions matrix, and the variance components of teachers, occasions, and teachers-by-occasions are estimated. Standard reliability coefficients follow immediately from this analysis. However, these coefficients can be estimated under three different assumptions:

1. Teachers and occasions are fixed.
2. Teachers are fixed, occasions are sampled randomly.
3. Teachers are random, occasions are random.

Three sets of assumptions limit generalizations about the rank order of the teachers. Under the first set, statements are strictly limited to these particular teachers and occasions. Under the second set, an attempt is made to generalize to a broader set of occasions, but restricted to these 8 teachers. In the third set, we attempt to generalize to a broader set of both teachers and occasions.

Why examine reliability under all three sets of circumstances? The answer is that though the first set is the most plausible (neither teachers or occasions were sampled randomly), we nevertheless seek broader generalizations from these data. Thus we can examine reliability under other circumstances and logically generalize to other situations. It must be realized that this is always a risky process, and some caution (and even skepticism) is necessary. Before analysis of variance tables, and reliability coefficients are given, the mean and standard deviation of each teachers engagement rate is given for both reading and mathematics. This information is presented in Table 1.

TABLE 1

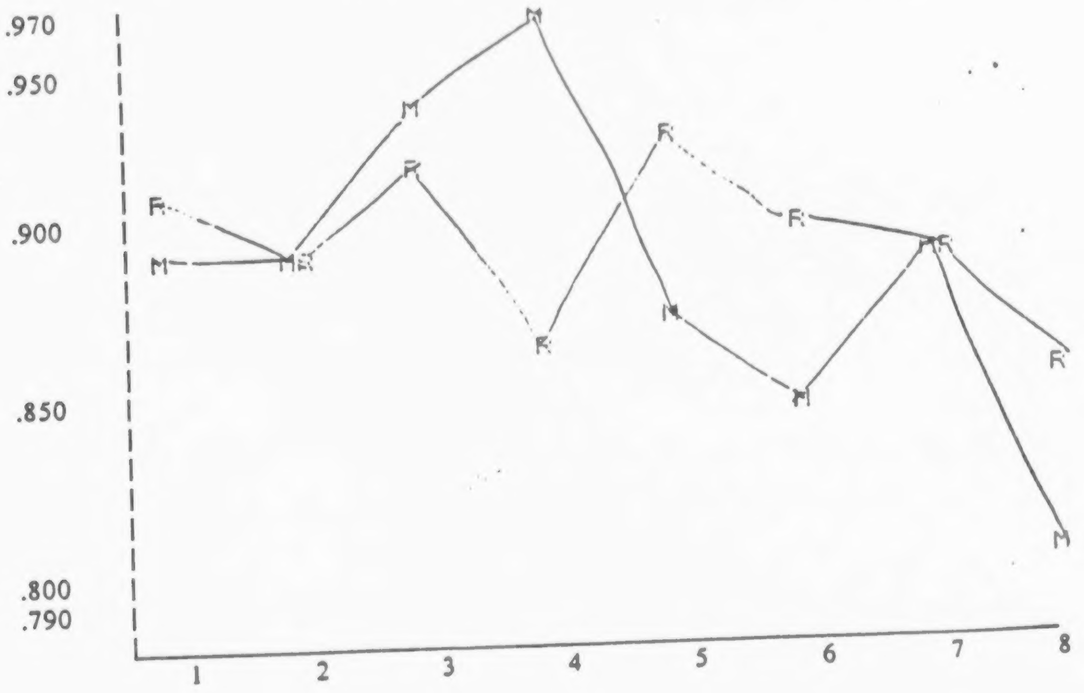
Teacher Means And Standard Deviations For Reading And Mathematics (Standard Deviations In Parentheses)

Teacher	Grade	Reading	Mathematics
1	2	.913 (.071)	.893 (.122)
2*	1	.892 (.102)	.891 (.071)
3	2	.921 (.087)	.939 (.081)
4	1	.861 (.100)	.969 (.048)
5	4	.929 (.073)	.867 (.119)
6	3	.907 (.069)	.844 (.093)
7	4	.886 (.082)	.889 (.098)
8	3	.845 (.135)	.791 (.135)

*In this class, different teachers taught reading and mathematics. In every other class, the same teacher taught both subjects.

In Figure 1 below, the average engagement rates for each teacher are plotted for reading and mathematics. As can be seen from this graph, the engagement rates for the two subjects are not closely related. In other words, knowing a teacher's average engagement rate for reading carries little information about the rate for mathematics. This implies that a single engagement rate score for a teacher should not be sought: single scores have little chance of generalizing beyond the particular subject matter. Rather, at this time the data suggest that engagement rates be obtained in different subject areas.

Figure 1. Average engagement rates plotted by teacher for reading and mathematics.



Preceding the reliability analyses for engagement rates, which are addressed to generalizability within subject, the obtained rates are graphed for each teacher, on each occasion. Rather than plot the actual figures themselves, however, the engagement rates are given as a linear trend across the eight occasions. That is, a weighted linear regression was fitted to each teacher's data across occasions. Each observed point was weighted positively by the number of sweeps the point was based on (the number of five minute sweeps used to computed the average on that particular occasion), and inversely by the standard deviation across sweeps. The actual weight used was:

$$W = N/(S + .050).$$

An additive factor was added to the denominator because in some instances the standard deviation across sweeps was zero. The additive constant was chosen as approximately the smallest observed standard deviation. The trend lines for reading are displayed in Figure 2 and those for mathematics are given in Figure 3.

Several comments can be made concerning the nature of Figures 2 and 3. First, there appears to be slightly more consistency in mathematics than reading. However, it is interesting that in both cases, that the highest initial engagement rates tend to remain constant across the occasions or to diminish. Conversely, the lowest engagement rates tend to increase across the eight occasions. Note that the occasions are roughly one month apart, so the trend is across the school year. It is also important to note that the teachers whose engagement rates are measured herein were receiving inservice training over the course of the school year. This training was apparently intended to increase engagement rates. The final observation on these trends is that very little practical difference exists in the average rates for the teachers—the range, though exaggerated in the graphs, is less than .20 from the minimum rate of about .79, the maximum of about .97. The trimmed range (deleting the maximum and minimum) is less than .10 (from about .84 to .94).

For trend plots, Ragosa et al. (1984) recommend the assessment of stability by an "index of tracking." This index "provides important advantages over the correlational analyses common in research on teaching. First, an index of tracking allows assessment of individual differences over more than two time points. Second, an index of tracking incorporates explicit statistical models for individual time paths and thus is applicable when time trends in behavior are present." In particular, Ragosa et al. recommend the use of the Foulkes-Davis Gamma statistic which is defined as the "probability that two randomly chosen time paths do not intersect during a specified time interval." For the present reading and math time paths, an approximation to this statistic is given by one (1.) minus the ratio of the number of observed intersections in the time paths to the total possible number of intersections. Thus the statistic, computed below, is one (1.) the proportion of observed to potential rank order changes in a specified interval of time.

For eight linear time paths, the potential number of intersections is simply the number of unique ways that eight objects may be taken two at a time, or $8!/(2! \times 6!) = 28$. In Figure 2, 18 actual intersections are observed giving an approximation to gamma as $1 - 18/28 = .36$. For mathematics, gamma is estimated as $1 - 5/28 = .82$. It is clear from this analysis that a more stable rank order of teachers is associated with mathematics. Moreover, if gamma is interpreted as a probability, then for reading one must conclude that the probability of any two teachers maintaining the same order over the time interval (eight months) is less than 50-50. (Again, it is noted that the range of engagement rates is very small, and it is consequently difficult to observe high reliabilities in restricted ranges.) We shall see below, that the gamma coefficients are closely related to standard assessments of reliability in terms of generalizability coefficients.

The basic information necessary for a reliability study is an analysis of variance for the teacher by occasion matrices (reading and math). There are the main effects for teacher and occasion, and the two-way interaction. The first step is to obtain the mean square for each source of variation. Analysis of variance tables are given in Table 2 (reading) and Tables 3 (math) below.

TABLE 2

Analysis Of Variance Table For The Teachers By Occasions Data Matrix For Reading

SOURCE	DF	MEAN SQUARE
Occasions	7	.003995
Teachers	7	.004489
0 by T	49	.004125

TABLE 3

Analysis Of Variance Table For The Teachers By Occasions Data Matrix For Mathematics

SOURCE	DF	MEAN SQUARE
Occasions	7	.004264
Teachers	7	.022529
0 by T	49	.005745

A preliminary comparison of these tables shows that there is much more variance among teachers in mathematics engagement rates, and this effect may be directly observed in Figure 1. Reliability coefficients are computed below. Each calculation begins with the mean square in Tables 2 and three, but differ in terms of assumptions. Table 4, presented next, gives three reliability coefficients for reading, and three for mathematics. The assumptions for each coefficient are also presented.

TABLE 4

Reliability Coefficients Under The Assumptions a) Teachers And Occasions Are Fixed, b) Teachers Are Random And Occasions Are Fixed, and c) Both Teachers And Occasions Are Random.

VARIANCE COMPONENTS

	T,O fixed	T fixed, O ramdom	T, O random
MEAN SQUARE			
Teachers	σ_T^2	$\sigma_T^2 + 8\sigma_{TO}$	$\sigma_T^2 + 8\sigma_{TO}$
Occasions	σ_O^2	σ_O^2	$\sigma_O^2 + 8\sigma_{TO}$
T by O	σ_{TO}^2	σ_{TO}^2	

RELIABILITY COEFFICIENT = $\dfrac{\hat{\sigma}_T^2}{\hat{\sigma}_T^2 + \sigma_{TO}/8}$

	T,O fixed	T fixed, O ramdom	T, O random
READING			
$\hat{\sigma}_T$	.0223*	.0223*	0
$\hat{\sigma}_O$	.0297*	.0191*	.0191*
$\hat{\sigma}_{TO}$	.0041	.0041	.0041
$\hat{\rho}_{xx}$	.630	.414	.414
MATHEMATICS			
$\hat{\sigma}_T$	.0231*	.0231*	0
$\hat{\sigma}_O$	.0531*	.0458	.0458*
$\hat{\sigma}_{TO}$	.0057	.0057	.0057
$\hat{\rho}_{xx}$	.797	.745	.745

*Numbers marked with asterisks are given as the square root of the variance component.

As evident in the above table, the reliability coefficients under assumptions A and C are identical. Therefore, the main discussion below involves the comparison of conditions A (both factors fixed) and C (both factors random). As may be expected, when we do not attempt to generalize beyond the given data, the coefficients are the highest. But in this situation, the coefficient has little practical meaning. On the other hand, when we attempt to generalize to different random sets of teachers and circumstances, two observations can be made. First, the reliability of the reading engagement rate is very low. In fact, it is approximately the same value as obtained for the gamma coefficient (.41 versus .36). Second, the reliability for the mathematics engagement rate is acceptable, and is also similar to its gamma coefficient (.75 versus .82).

It must be realized, however, that the coefficient for condition C is a statistical estimate of generalizability. It rests on the assumption that both teachers and occasions have been randomly sampled from much larger populations. This is patently untrue, but the last exercise in generalizability is logical—the coefficient for math suggests that engagement rates may be stable in a larger population, while that for reading suggests the opposite. Given the uniqueness of the schools from which the observations were taken suggests that in the final analysis, the usefulness of these results is very limited.

STUDENT ACTIVITY STUDY

The data collected during the classroom observations enabled a fine grained analysis of student activities during those time periods. The following sets of graphs depict those activities. They represent one day's observation and therefore may not be typical.

Figure V.

Reading

1 What % of the time were students recorded as doing the following activities during reading instruction across teachers.

2 What % of the time were students recorded as doing the indicated activities during reading.

3,4,5 What were differences among teachers in the % of time students were recorded as doing the indicated activities during reading.

6.7.8 What % of the time were teachers recorded as doing the following activities during reading instruction.

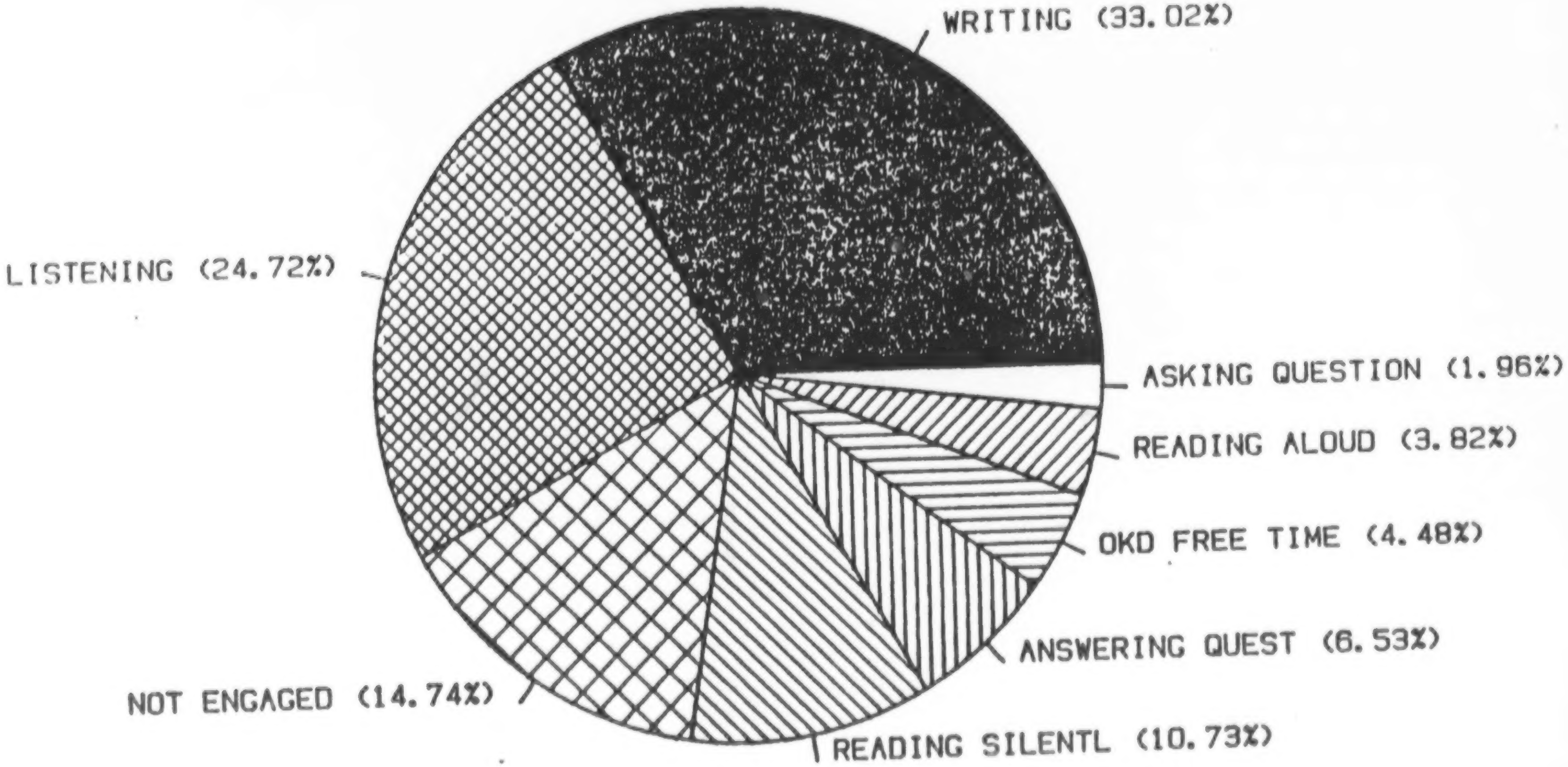
9 What was the average engagement rate and the average % of time teacher did the following during reading:

1 - questioning
2 - with small group
3 - giving directions
4 - presenting to all
5 - introducing purpose
6 - monitoring seatwork
7 - distributing materials
8 - grading papers
9 - organizing material
10 - disciplining
11 - other instruction
12 - staying in one place
13 - moving around
14 - at desk

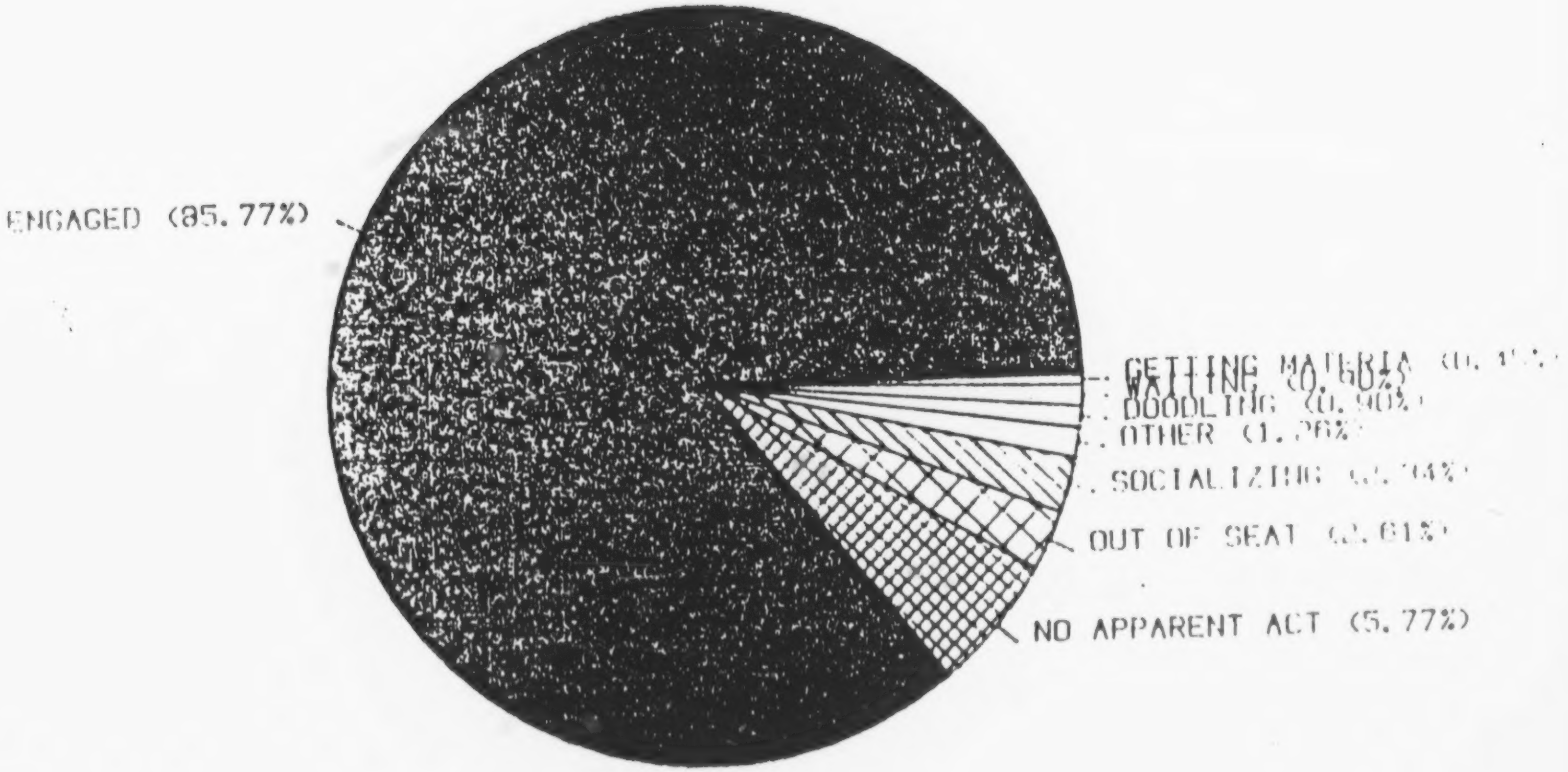
10 What were average engagement rates for each teacher when they were doing the indicated activities during reading

11 What was the average ER for each teacher when students working with the teacher and independently and what % of the time were students working with the teacher during reading.

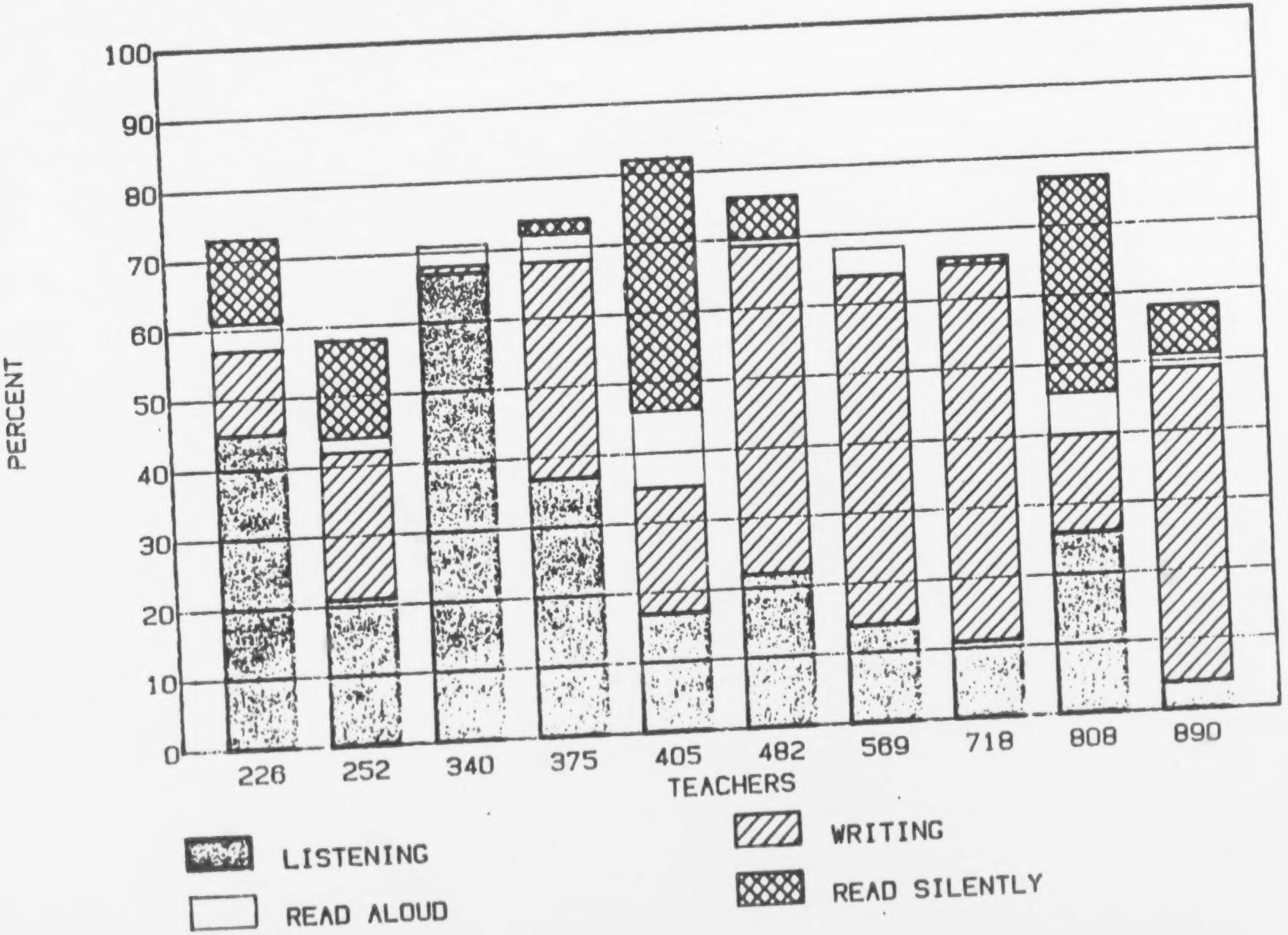
READING INSTRUCTION



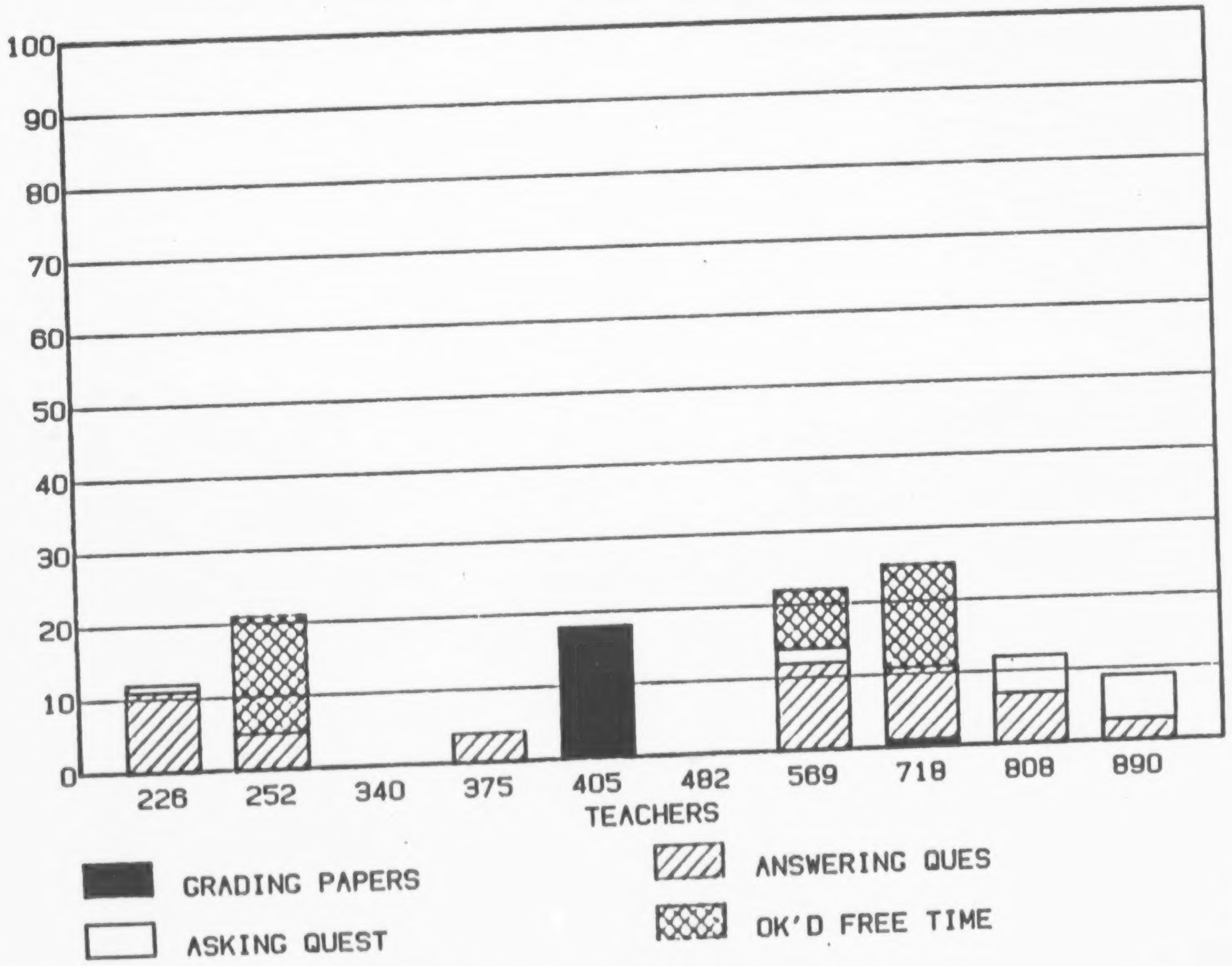
READING PERIOD-NOT ENGAGED



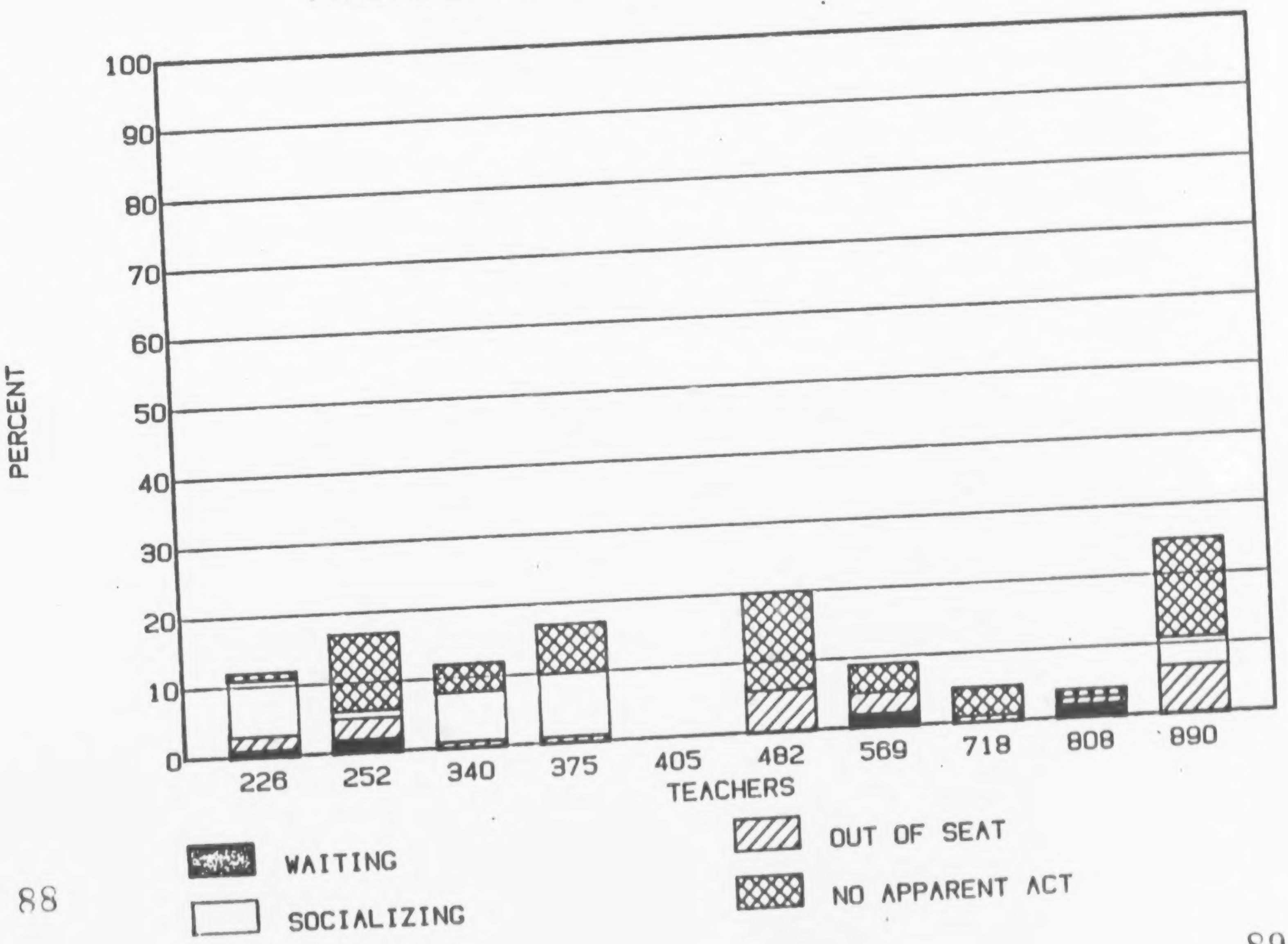
READING INSTRUCTION-ENGAGE



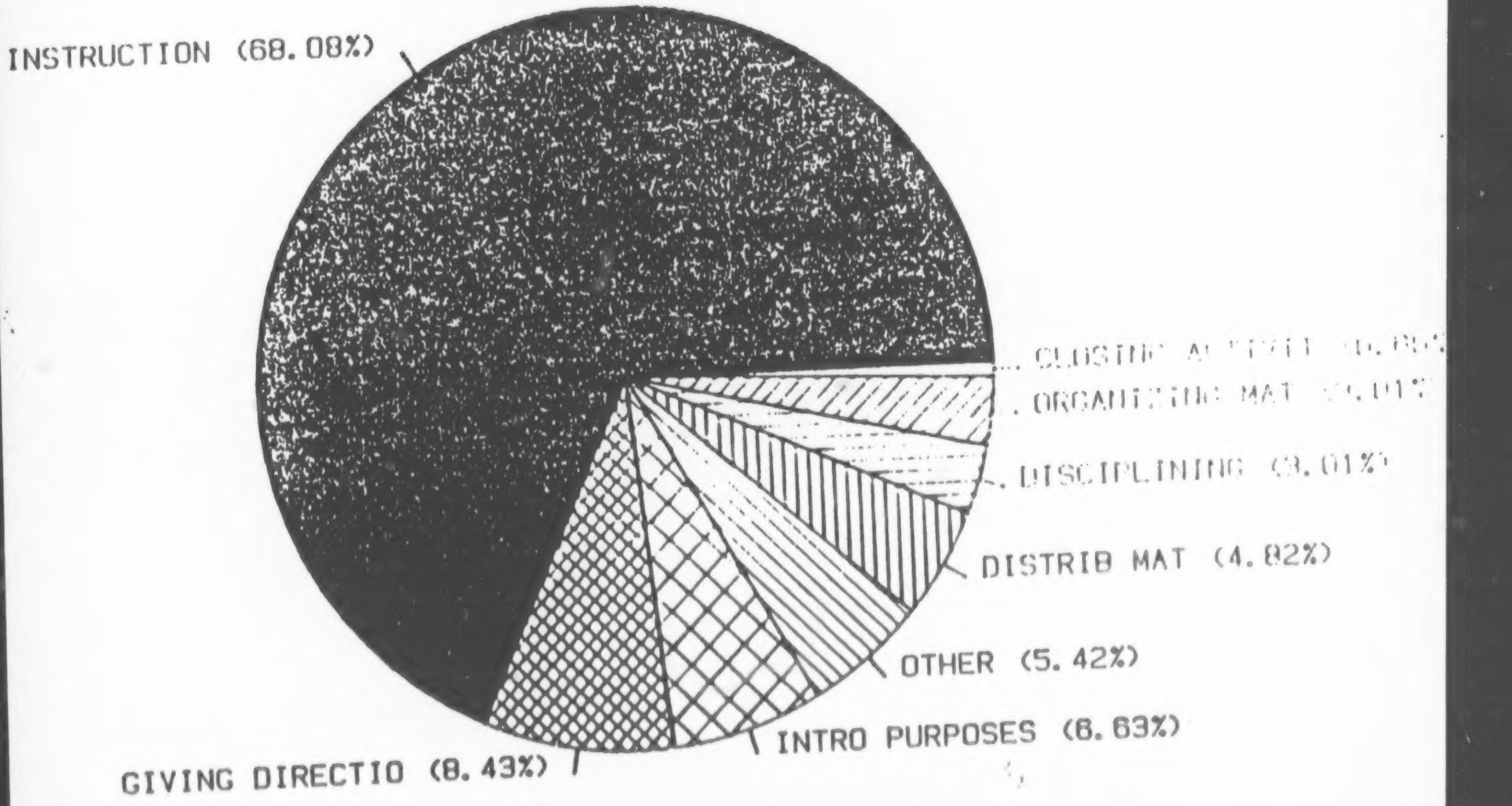
READING INSTRUCTION-ENGAGE



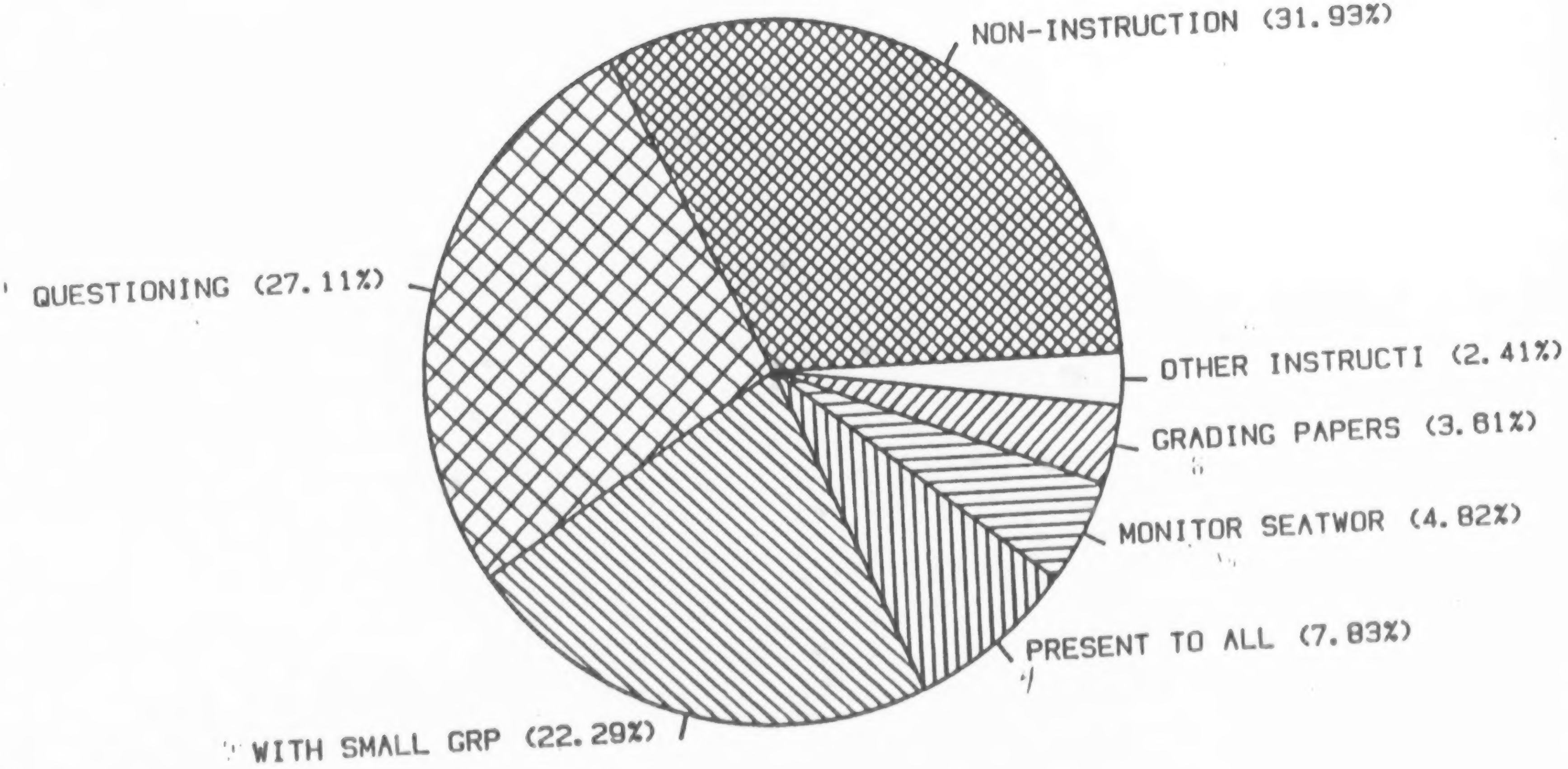
READING INSTRUCT-NOT ENG



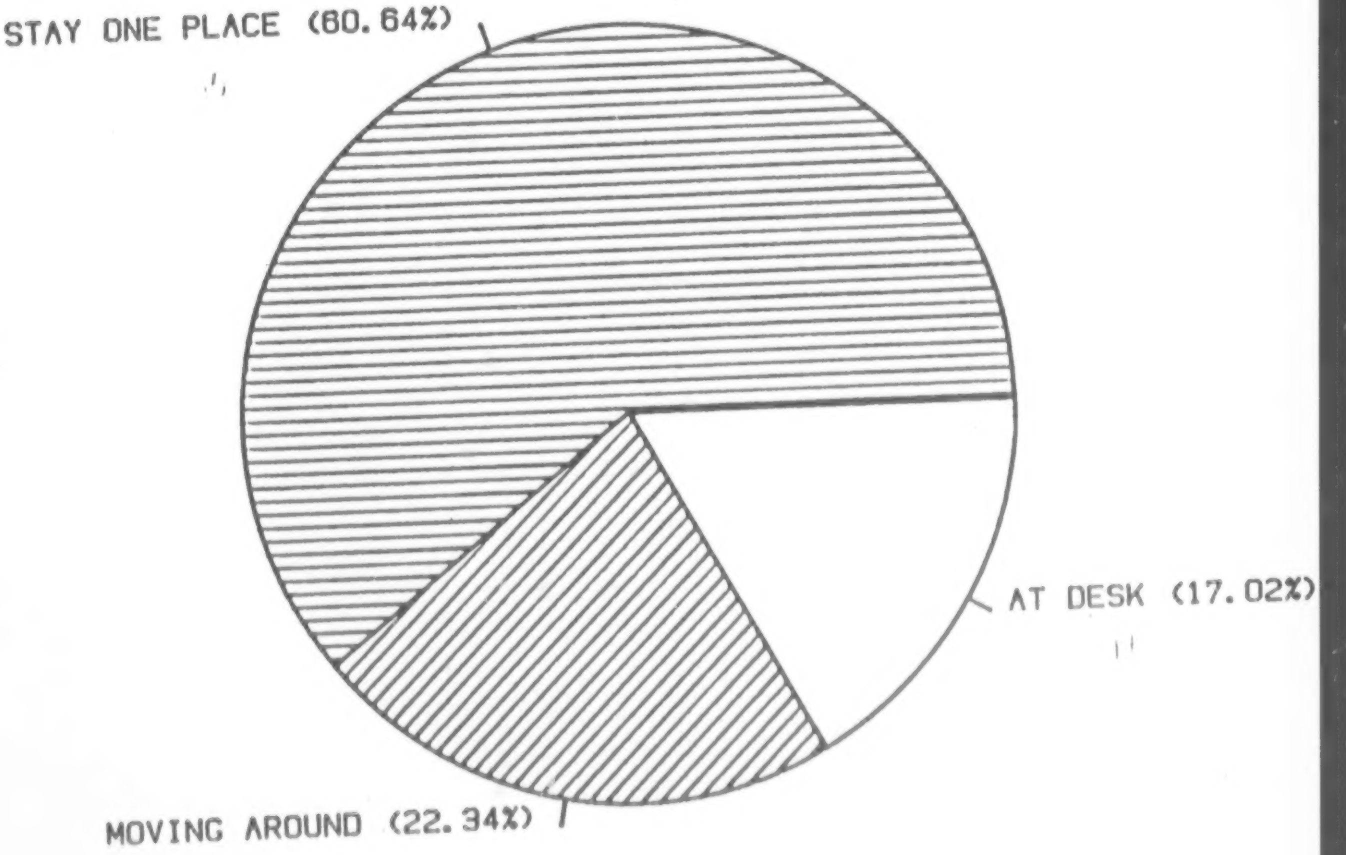
READING PERIOD ACTIVITIES

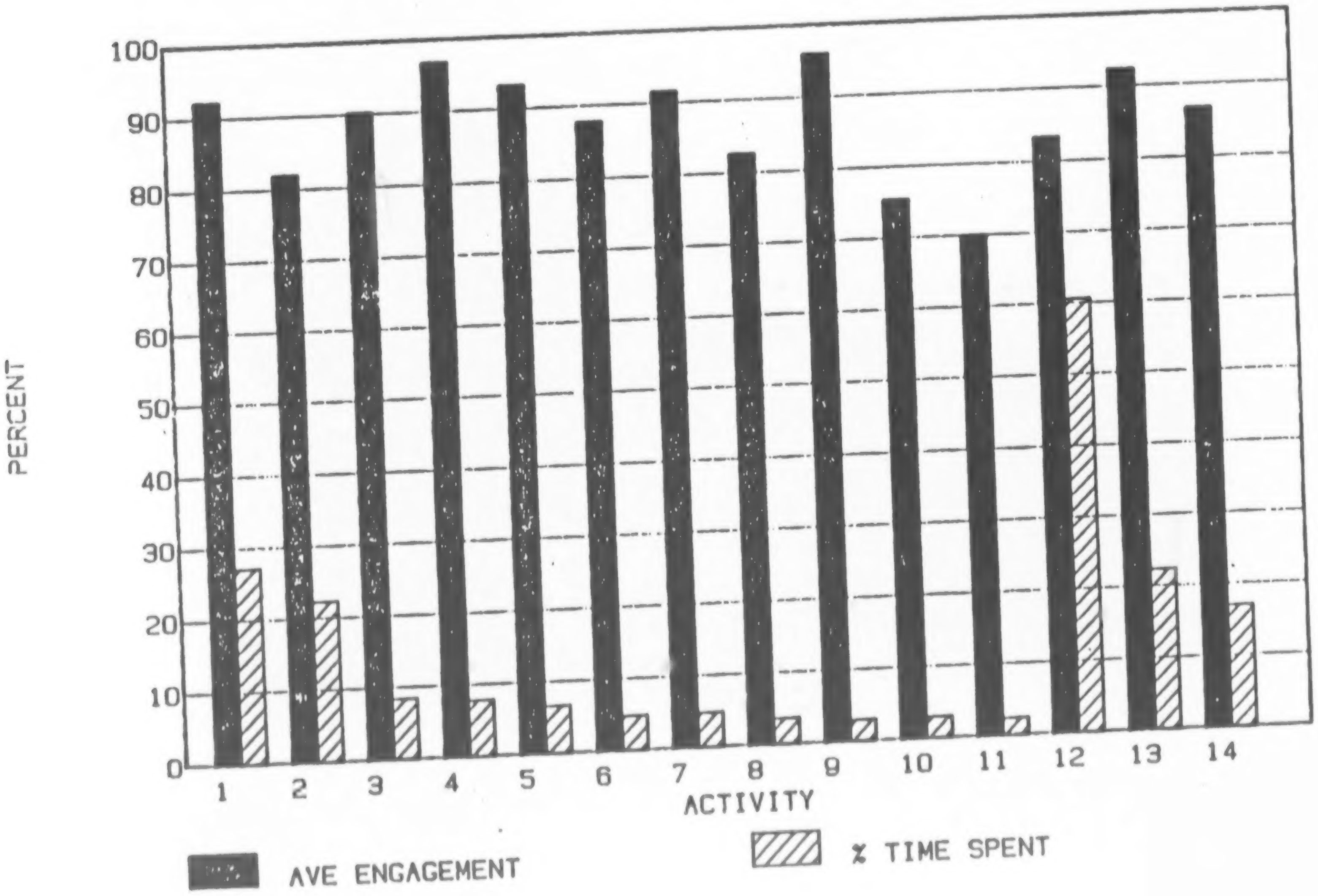


READING PERIOD ACTIVITIES



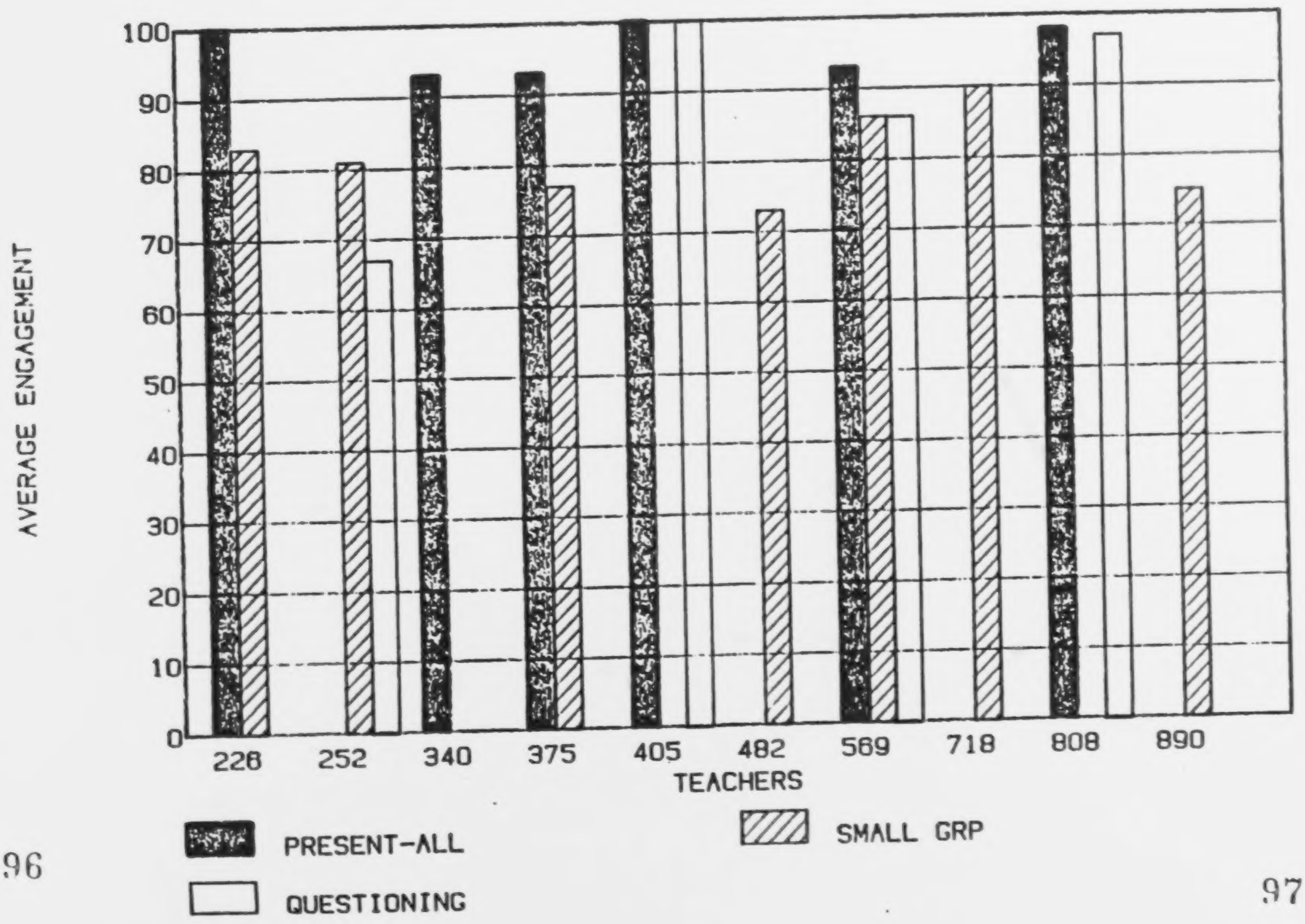
READING PERIOD ACTIVITIES

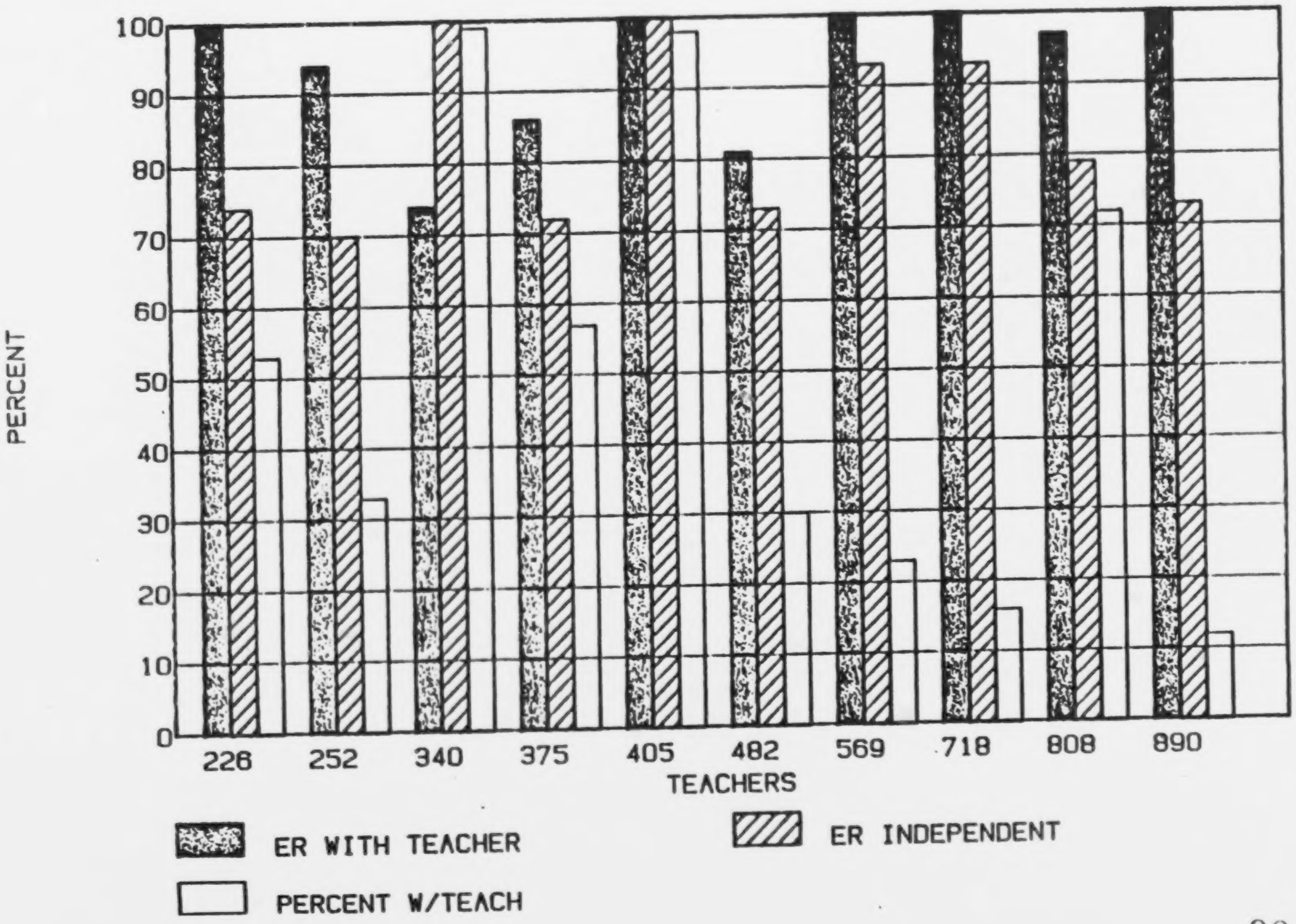




TEACHER ACTIVITY-READING

READING-TEACHER ACTIVITY




READING INSTRUCTION

For Math

12, 13 = 1&2 in reading

14, 15,16 = 3,4,5 in reading

17,18. 19 = 6,7.8 in reading

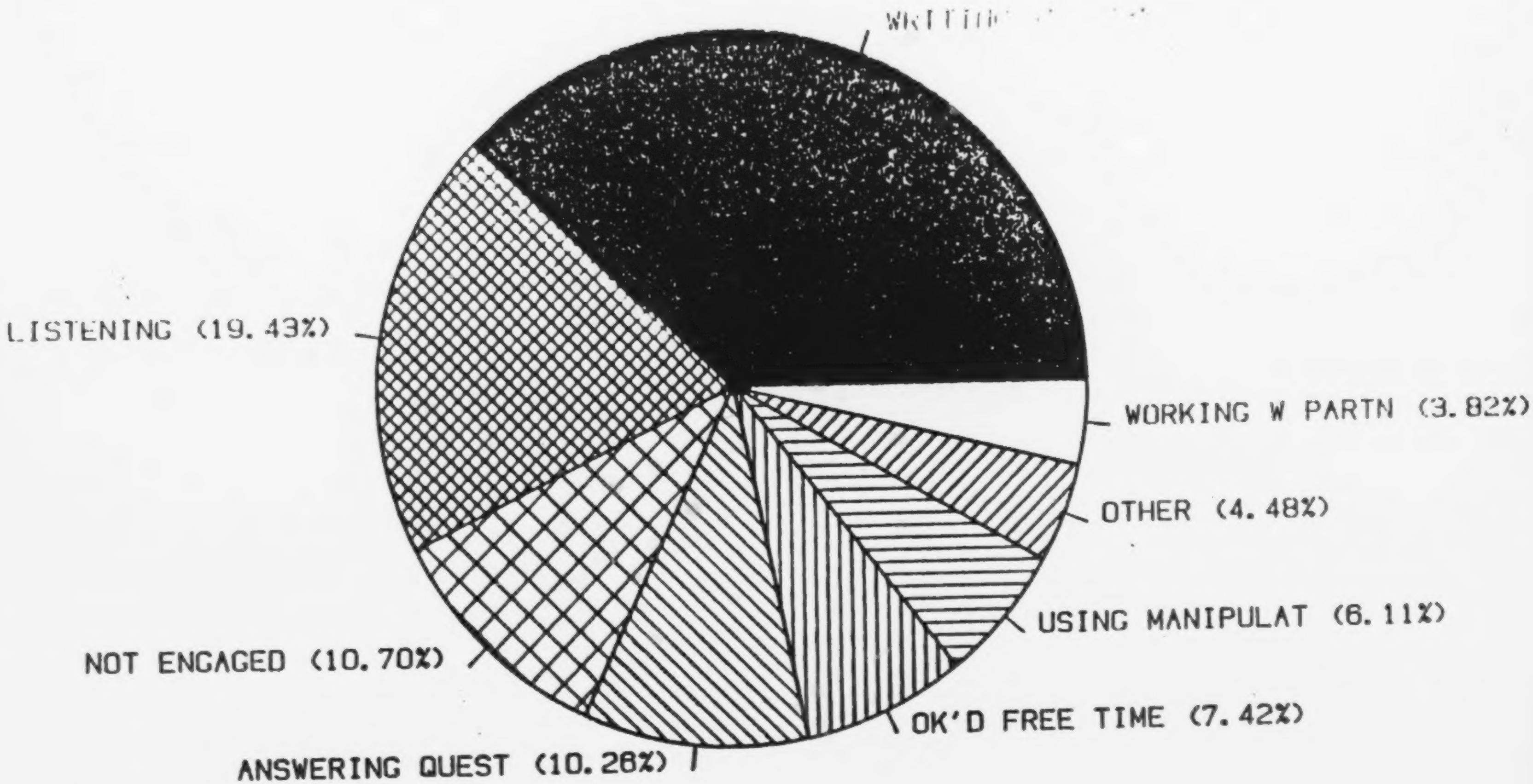
20 = 9

1 = monitoring seatwork
2 = questioning
3 = giving directions
4 = introducing purposes
5 = with small group
6 = grading papers
7 = introducing purpose
8 = distributing materials
9 = organizing materials
10 = disciplining
11 = other instructions
12 = staying in one place
13 = moving around
14 = at desk

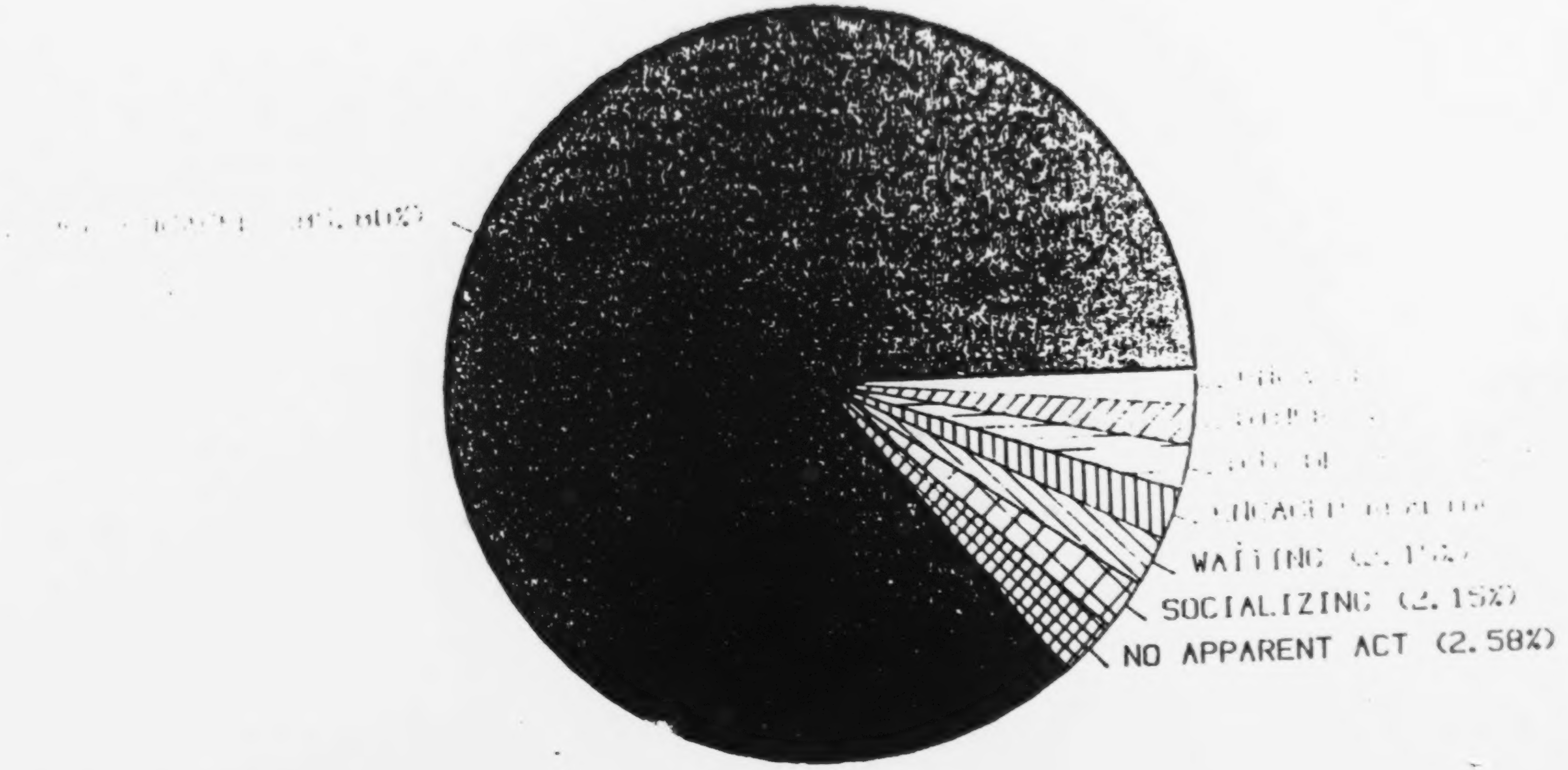
21 = 10

22 = 11

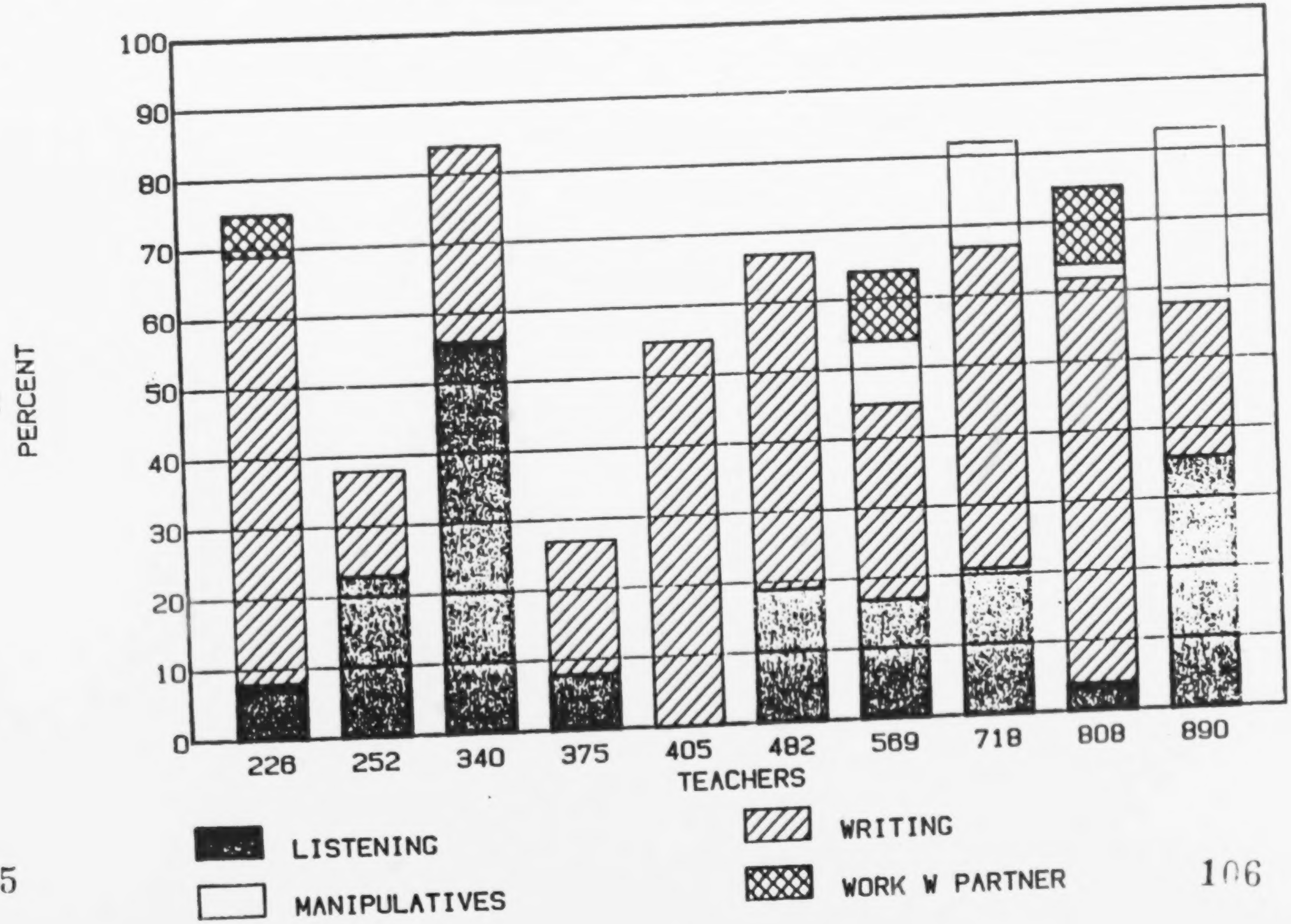
MATH INSTRUCTION



MATH INSTRUCTION



MATH INSTRUCTION-ENGAGED



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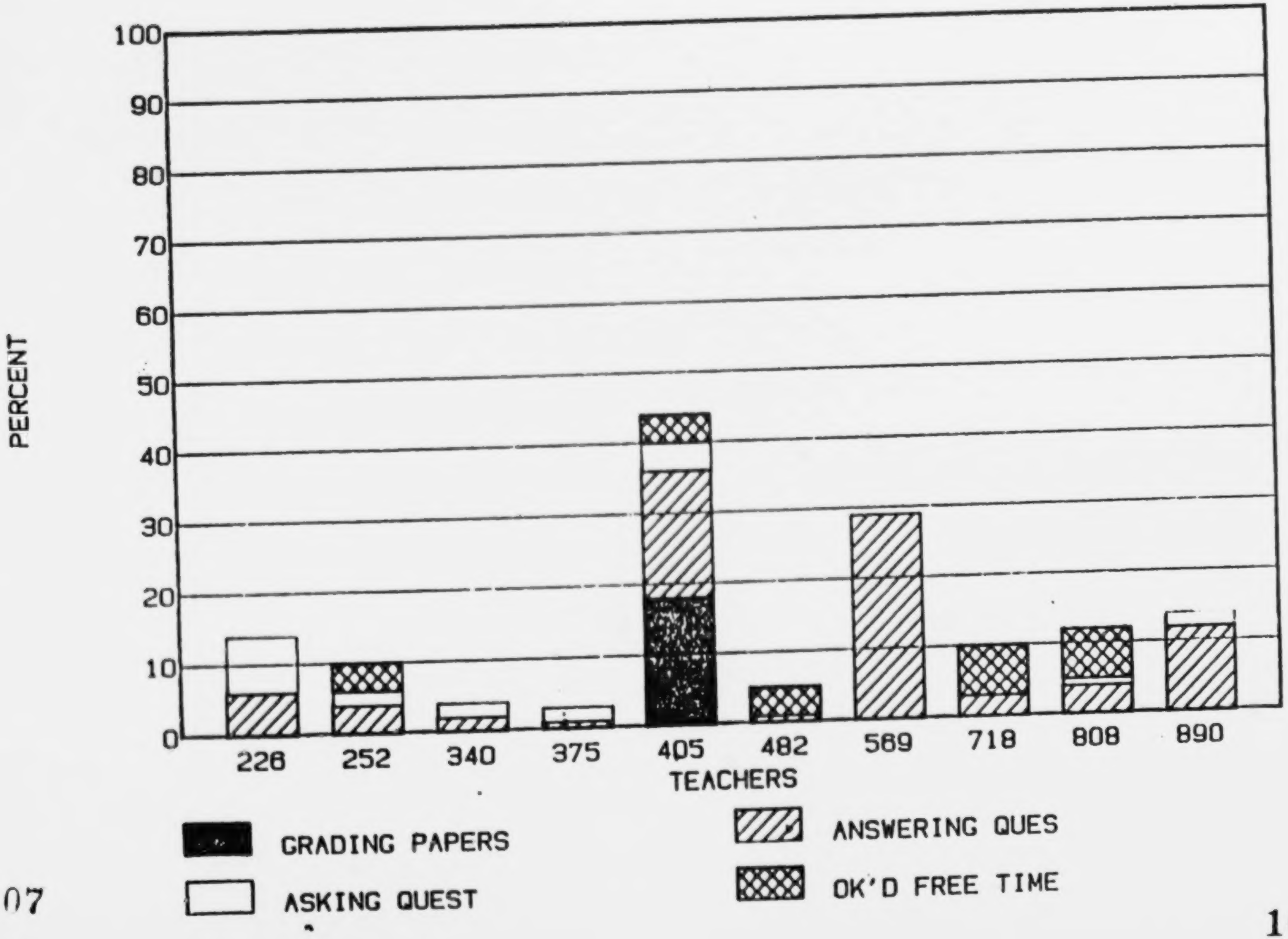
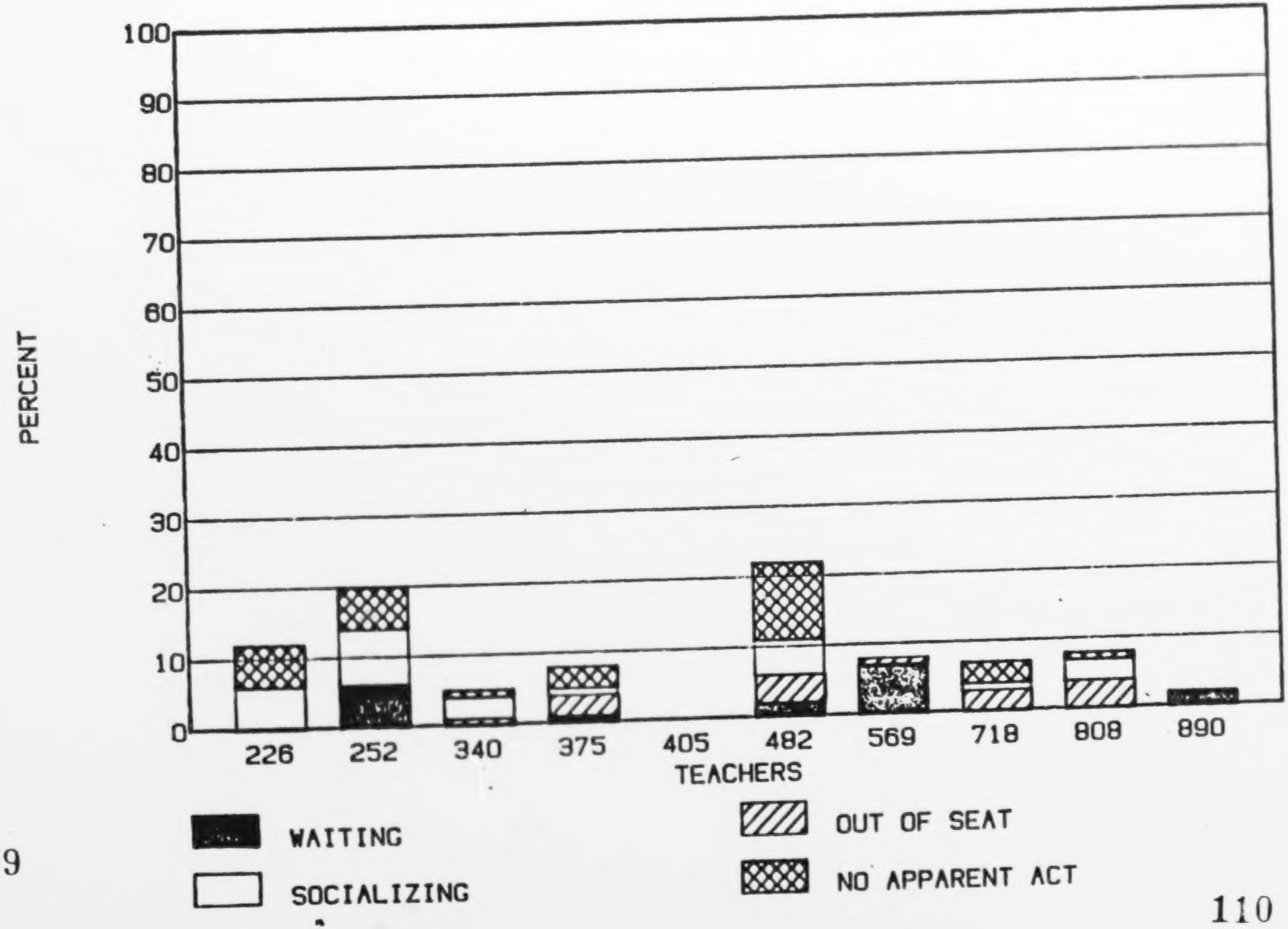
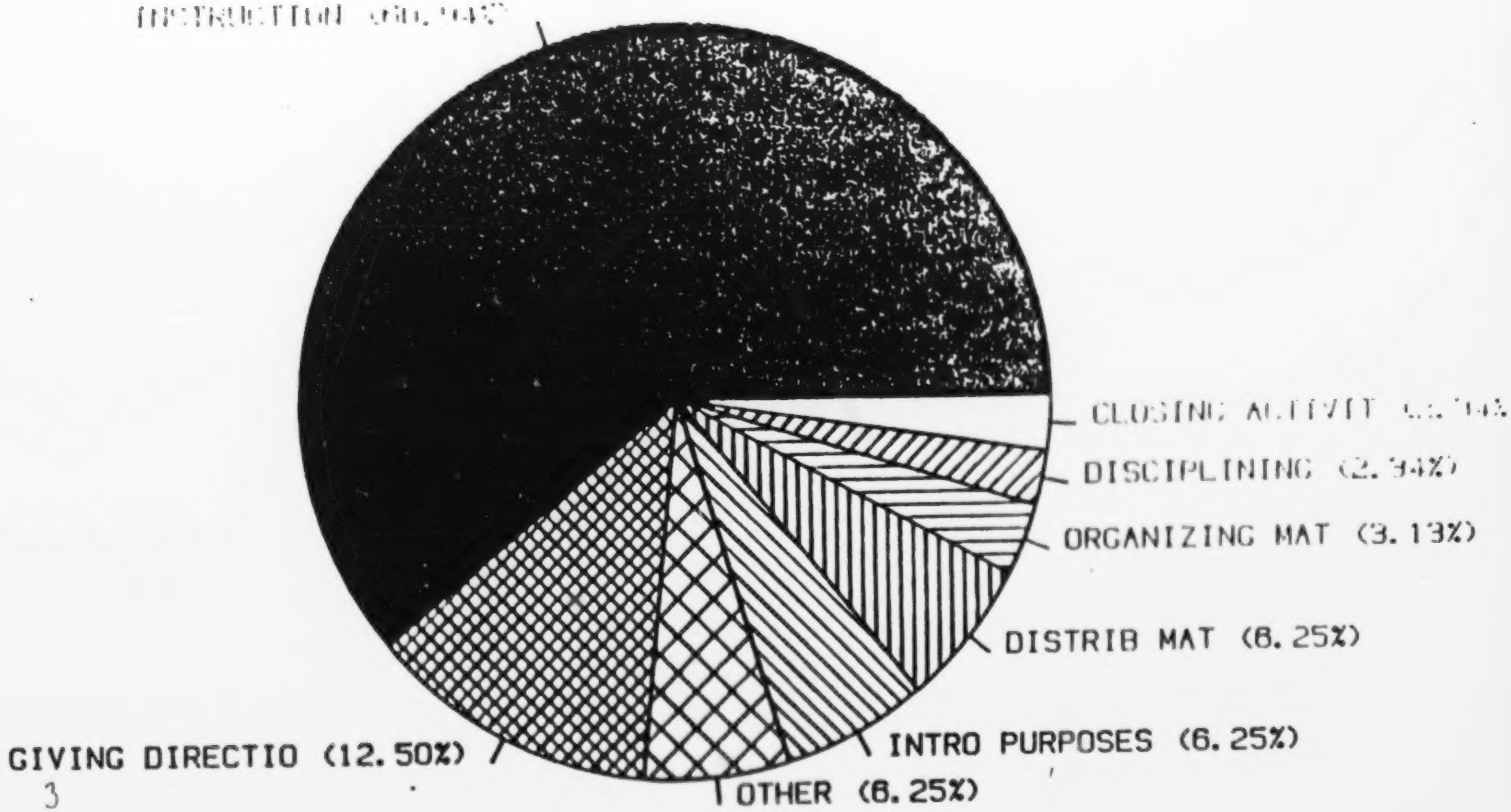


MATH INSTRUCTION-NOT ENG



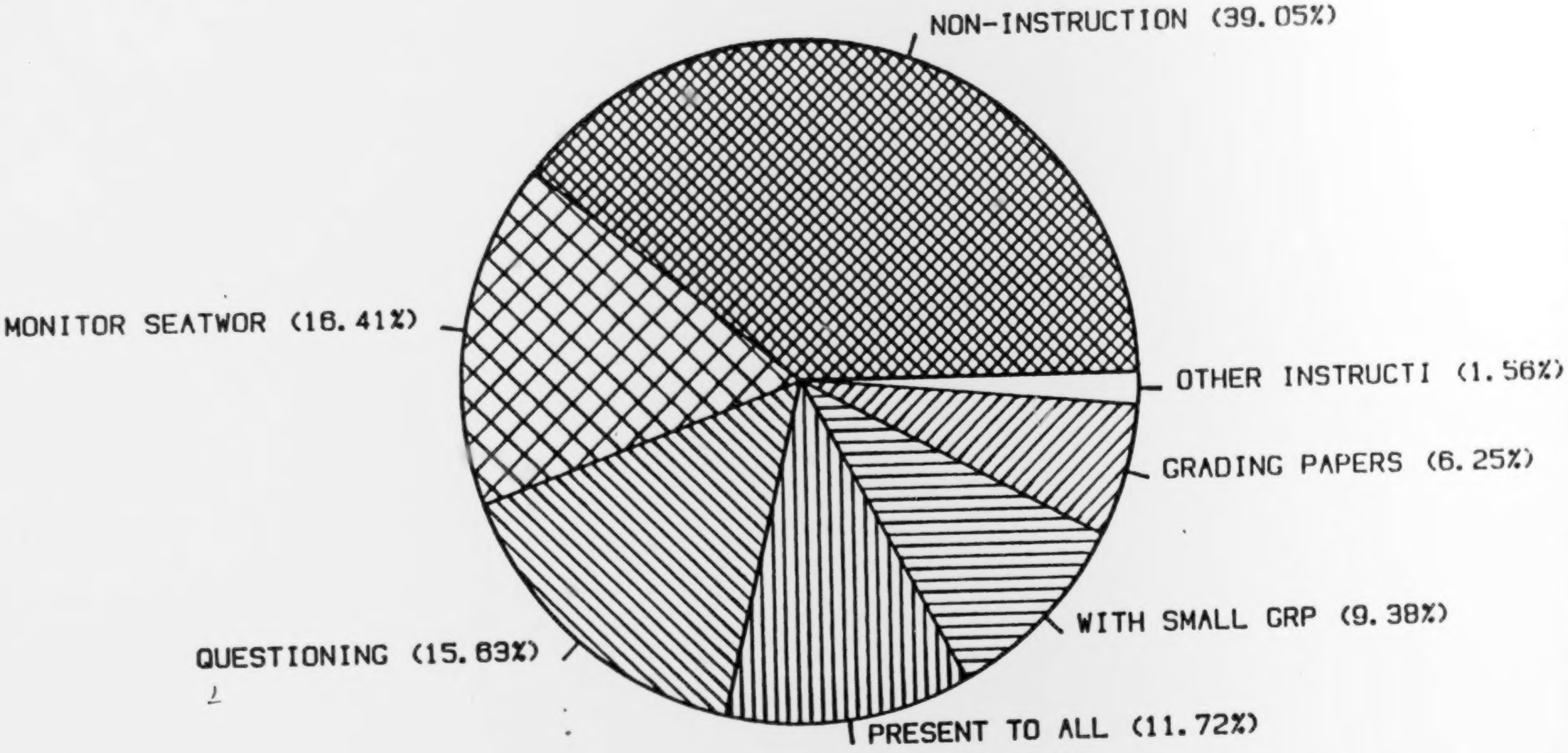
V. 17

MATH PERIOD ACTIVITIES



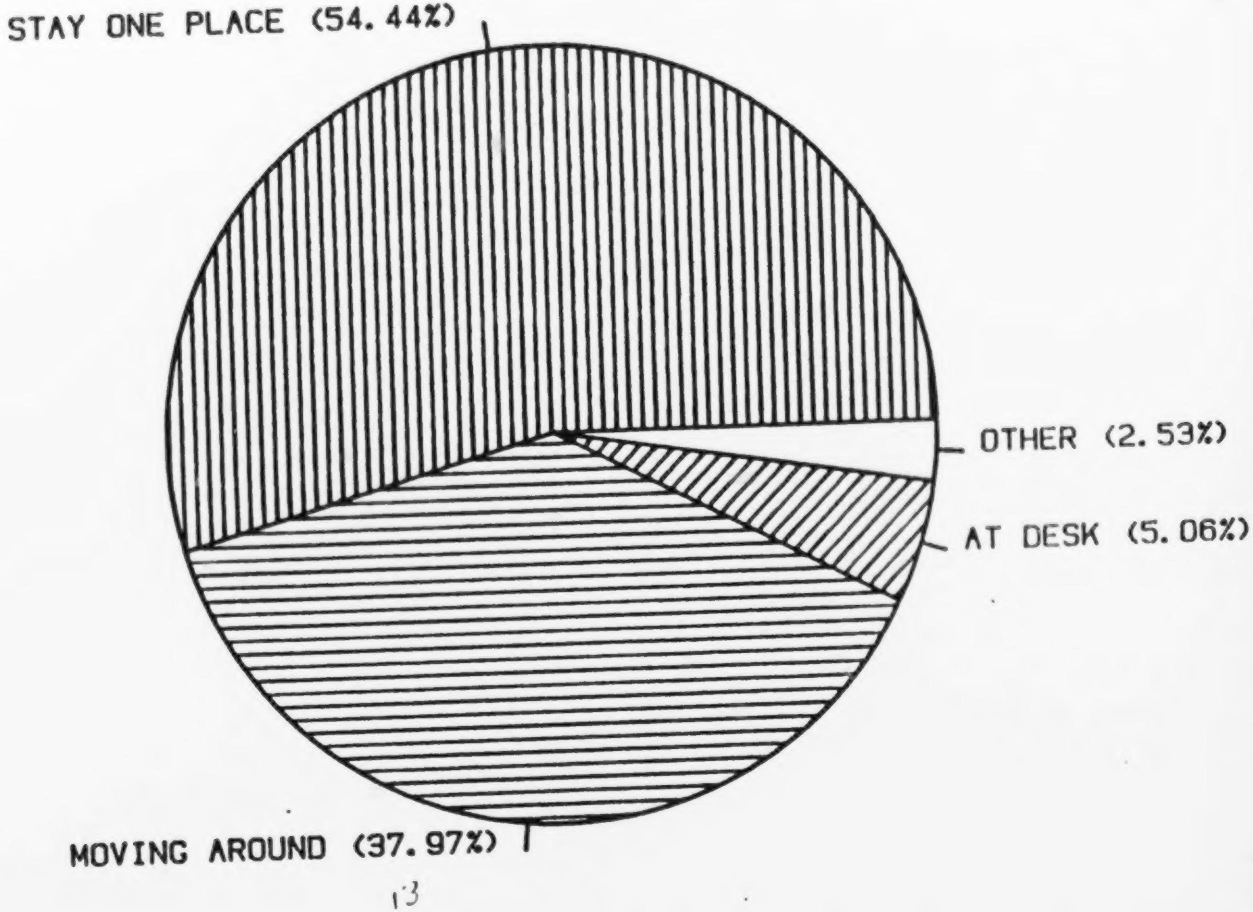
3

MATH PERIOD ACTIVITIES



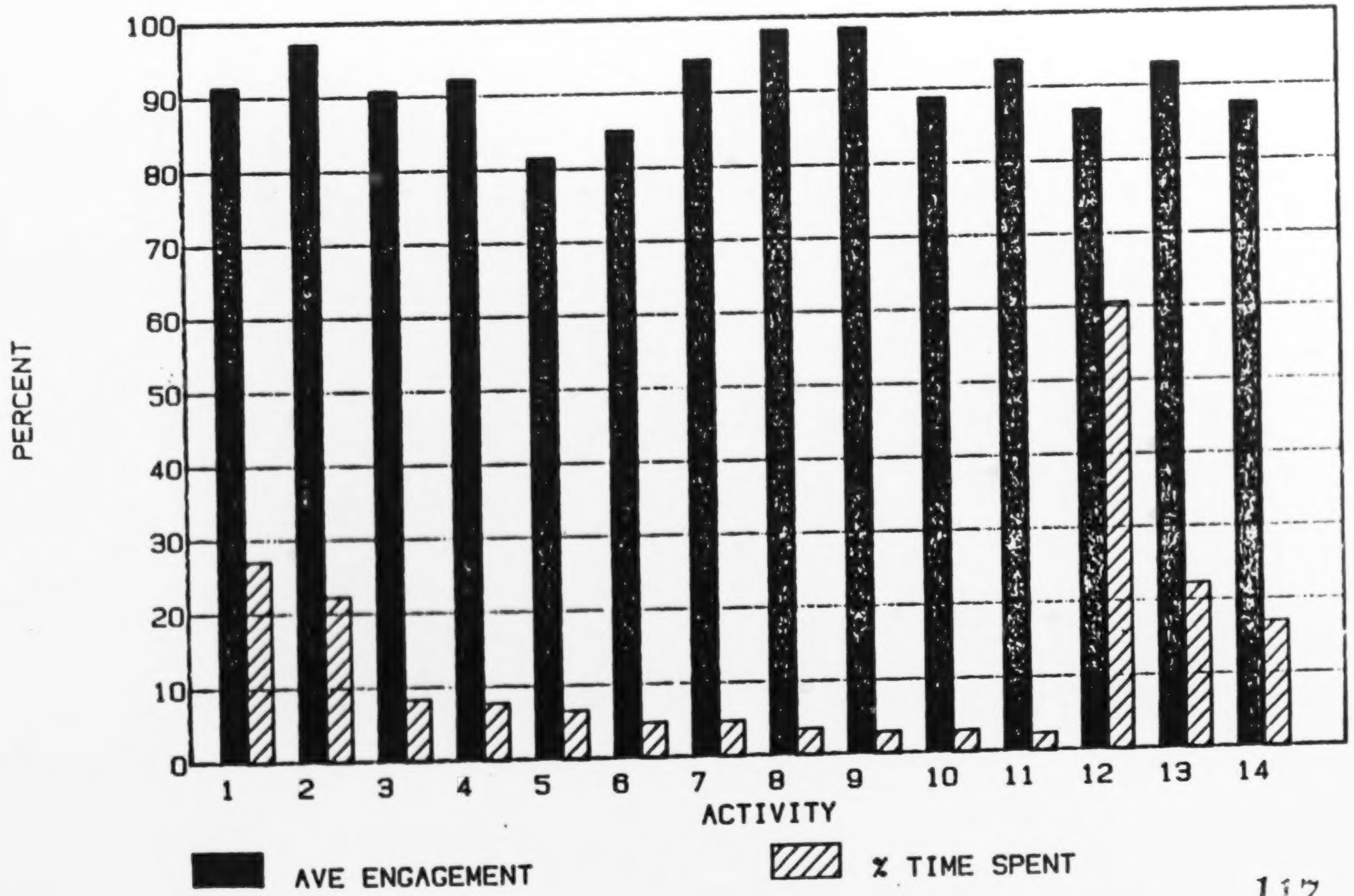
V. 19

MATH PERIOD ACTIVITIES

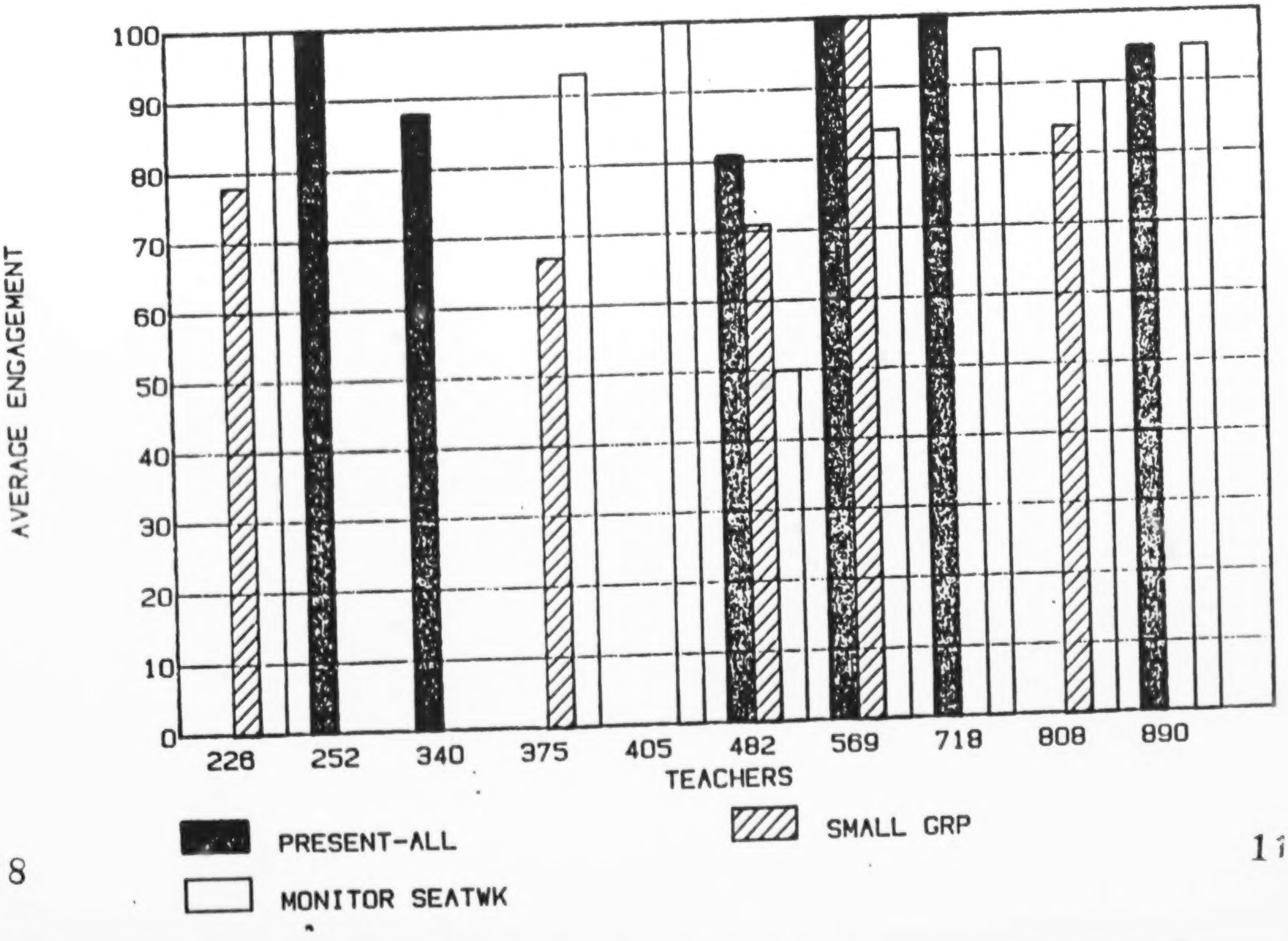


13

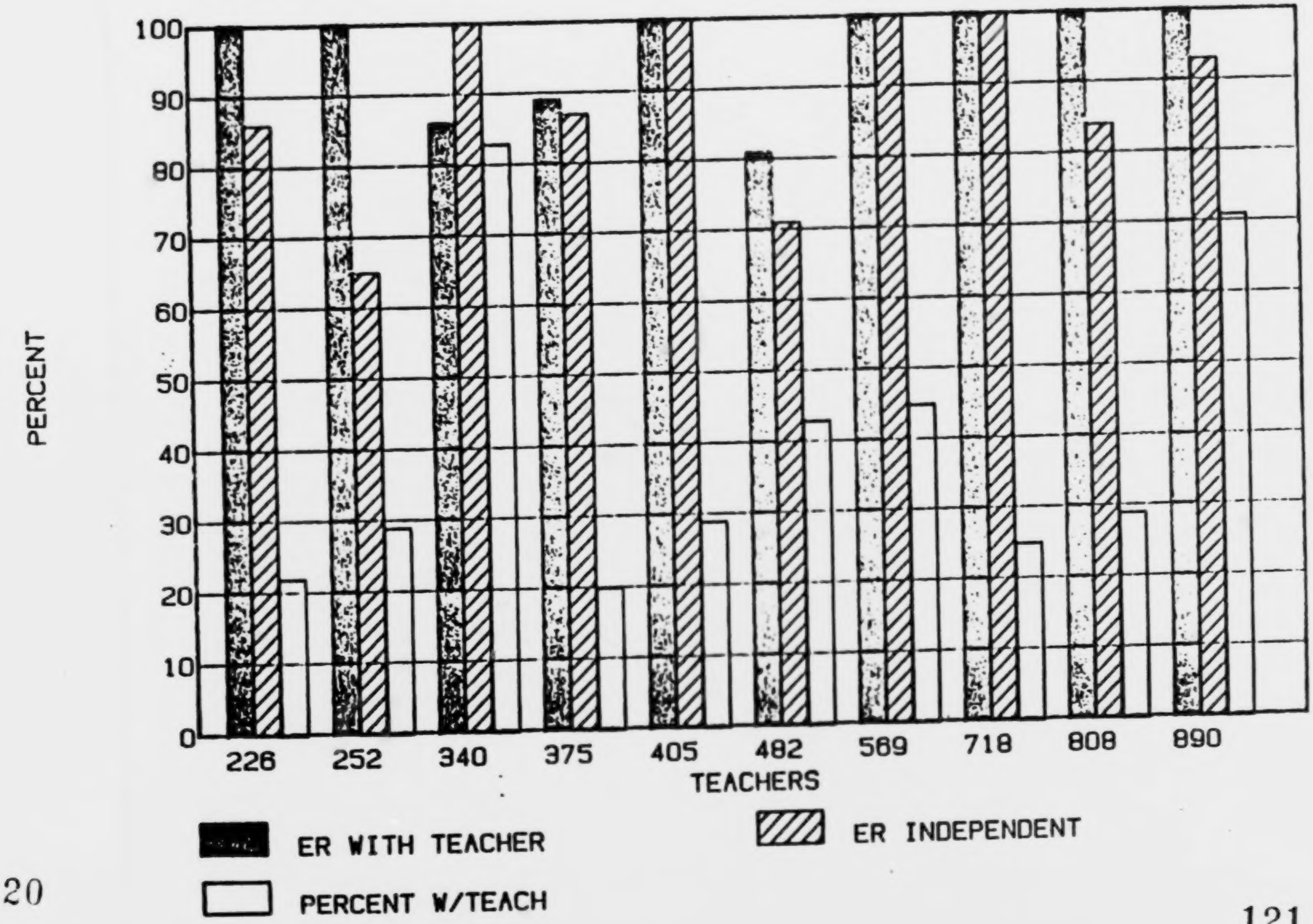
TEACHER ACTIVITY-MATH



MATH-TEACHER ACTIVITY



MATH INSTRUCTION



CHAPTER VI

SUMMARY AND RECOMMENDATIONS

This section of the report is organized around the layered pattern of impact shown in Figure 1, page ii of this report.

Level I—Changes In Knowledge Of Teachers And Administrators

Information was provided to teachers and administrators. It was presented in many forms: video tapes, demonstrations, and lectures. The teachers' comments indicate they they felt overwhelmed at times with the amount of information they received, but generally were pleased with the content which was presented. When requested to do so, the teachers were able to identify specific content which had been presented.

A climate which was conducive for change seemed to be established. The principals provided time and coverage to allow peer observations. Teachers reported that they participated in these observations and found them to be useful. Support groups were established and met regularly. Many of the teachers indicated that they wanted to continue these meetings. There appeared to be no negative consequences for trying new ideas or techniques. In fact, at least one teacher indicated that there was too much pressure for trying new ideas.

Level II—Changes In Behaviors Of Teachers And Administrators

Although there is no quantitative evidence of changes in teacher behaviors, the questionnaire data indicate that there were changes. Teachers started specific changes they had made in instructional strategies or methods; they indicated that they now used time in different ways; they reported improvements in collegiality and professionalism.

Level III—Changes In Behaviors Of Students

Although initial engagement rates were high, there was a moderate increase in engagement rate after the first year of training. There was a small increase in engagement after the second year of training, and a decrease after the third year of training. The decrease is probably due to the fact that engagement rates were inflated by measurement error during the third data collection (after the second year of training). It seems that there may be an optimal engagement rate which is less than 100%.

Changes in absenteeism did not occur. This is evidently due to the fact that it was relatively low from the beginning. A decrease in the total number of disciplinary actions did occur although, again, this was not an area of concern.

Level IV—Change In Achievement Test Scores

There appeared to be no consistent change in achievement test scores which could be attributed to the inservice. There was a positive correlation between engagement rate and achievement test scores, but it was smaller than the correlation between previous and current achievement test scores.

The lessons learned from this four year school improvement effort suggest recommendations for other small rural districts around three different areas, (1) the viability of the four-day school week, (2) the appropriateness of the effective schools research for improving the instructional program/increasing student achievement in the small rural school, and (3) the delivery of staff development to small schools in isolated settings. In addition, but for a different audience, some recommendations are included concerning the research design and the limitations of data collection procedures for this kind of field-based research.

VIABILITY OF THE FOUR-DAY SCHOOL WEEK

As indicated earlier in the report, the four-day school week was instituted as an alternative scheduling option by the Colorado State Department of Education as a way of helping districts cope with budget problems related to the increasing energy costs of the early 1980's. While energy costs have since declined, school budgets have continued to get tighter, particularly in the Mid-west. These financial problems are due to the general deterioration of the agricultural and energy economy, and the demands of recent school reform legislation for expanding programs, e.g. adding courses in math, science and foreign language. As a result, interest in the four-day week as an organizational option for making better use of the limited education dollar continues.

One of the major questions of districts considering this option is whether the schedule will have a negative impact on children's learning, particularly those students in the elementary grades. The findings from this study suggest that students in grades K-4 in these two schools did not have problems maintaining a high level of engagement across the 20% longer school day which is required when school meets four rather than five days a week. There was also no indication that student achievement was adversely affected. Furthermore, if the majority of extra-curricular activities take place on Friday when school is not in session, the time available for instruction is actually increased over the traditional schedule.

Recommendation: State policy regarding the definition of the school day and the school term should include the four-day week organizational option as a way of helping small rural schools make better use of available educational resources.

The Follow Through Research Project focused primarily on those aspects of the effective schools research which were concerned with increasing the efficient use of student and teacher instructional time (time-on-task/engagement rate). The data from the schools in these particular sites suggest that engagement rates of students was quite high at the start of the project and that while the engagement rates increased for a time during the life of the project, achievement scores did not reflect this gain in time efficiency. This does not mean that efficient use of time is not important. What it does suggest is that there are limits beyond which increasing engagement rates will not provide sufficient pay-off in student achievement to make the necessary effort to achieve these increases worthwhile.

Recommendation: "If it ain't broke, don't fix it!" The notion of time-on-task/engagement rates should be viewed in a diagnostic way. If the data collected indicates that engagement rates are in the 75% range or higher, school improvement efforts which focus on other necessary conditions for an effective school will be a better use of the limited time and resources which small rural schools have available for this purpose.

OTHER OBSERVATIONS CONCERNING THE EFFECTIVE SCHOOLS RESEARCH AND SMALL RURAL SCHOOLS

While time efficiency was the major focus of the Follow Through research effort, The Cotopaxi/Westcliffe Project included work on a number of other dimensions of the effective school research. This work paralleled a larger school improvement effort of the Mid-continent Regional Educational Laboratory which resulted in the formulation of "nine propositions" defining an effective school. The nine propositions provide a structure for sharing a number of observations from the Cotopaxi/Westcliffe experience concerning small rural schools and these particular dimensions of the effective schools research.

Proposition 1: There is a level at which resources must exist to provide a base for an effective school.

> This proposition is concerned primarily about physical facilities. The effective schools research suggests that it is not the age or design of a building that is important to student learning, but whether it is well maintained and cared for. The condition of the physical facilities sends a strong message to the students and teachers about whether or not anyone really cares about what goes on in that building. The schools in Cotopaxi and Westcliffe were viewed with pride. The school is still the center of community activities. The buildings may be old, but they are generally neat and clean.

Proposition 2: Physical safety and psychological security must exist in an effective school.

> This is an area where there is a significant difference between the inner-city schools of a Detroit or Oakland and the schools in Cotopaxi and Westcliffe. Physical and for the most part psychological security tends simply not to be an issue. It is a given that the school is a safe place for both teachers and students. The climate in rural schools has been described in number of studies as that of an extended family.

Proposition 3: Student achievement will be greater when the system is consistent in its purposes, expectations, methods and evaluations.

> At the more global level, Cotopaxi and Westcliffe did well on this one. The tight linkages which exist between the school and community guarantee a common core of values and expectations. Administrators and teachers are hired who hold values that are consistent with those of the community. At the more specific, operational level the schools did not do as well. A written curriculum, K-12, did not exist or was not used. With staff turnover, the curriculum tended to change from one year to the next. There was not the coherent content focus across the curriculum which research suggests is necessary for an effective school.

Proposition 4: Student achievement will increase when additional time is available for the student(s) to master the prescribed knowledge and skills.

> As suggested earlier, the "time-on-task" issue takes on some quite different dimensions in these sites. The high absenteeism, chronic discipline problems which tend to cut deeply into students engagement with learning in urban areas was not present in Cotopaxi/Westcliffe.

The four-day week, allowed for moving most of the extra-curricular activities to Friday, when school was not in session.

Proposition 5: Increased student engagement will increase achievement.

As indicated earlier, the engagement rates were quite high to begin with in the two project schools and increases were realized that were statistically significant. However, achievement score while improved, did not show the same degree of change. This suggests that if engagement rates are already fairly high, investing time and energy into pushing them even higher may not be the best use of scarce school improvement resources.

Proposition 6: High student success at daily tasks will occur when student engagement is accompanied by effective instructional practice.

Effective instructional practices, as used here, include, but are not limited to, high expectations, clearly stated objectives, daily review of previously learned material, continuous monitoring of student progress, providing internal and external rewards. While all of these notions are quite straightforward and apparently appropriate for schools of any size, a few comments are in order concerning the issue of "high expectations." There is considerable evidence that if teachers hold high expectations for students they are likely to live up to those expectations. If a teacher feels that a student is going to have trouble learning, he probably will. Because of the intimate knowledge of students and their families in these sites, there was the temptation to "write off" a younger sibling if the older brother or sister was a trouble maker or a slow student.

Proposition 7: Student achievement is highest in organizational settings that provide a maximum opportunity for individual student growth.

Tutoring and team learning are strategies which research suggests are very effective approaches to instruction. Such strategies, while not in evidence at the beginning of the project, were encouraged and activated by some of the teachers. Rigid ability-grouping schemes which have been demonstrated to have a negative impact on achievement were not evidenced in the two schools.

Proposition 8: Improvement occurs when the values or culture of the organization reflect the belief that everyone can improve and that improvement is expected.

This proposition and the following—

Proposition 9: Improvement will occur when the school organization is managed to encourage and support personal and organizational development.

. . . relate to the overall capability of an institution to renew itself. As stated at the outset of this report, rural education has traditionally not enjoyed this developmental capacity. Because of the multiple demands of rural school leadership, orchestrating an ongoing school improvement effort is just not in the cards. This four year effort was a unique experience which will likely not be replicated in these two schools.

PROVIDING STAFF DEVELOPMENT IN SMALL RURAL SCHOOLS

The Content. Two issues appear to be important in determining the content of a staff development or school improvement effort. What aspects of the schooling process should be addressed, and given the inter-relatedness of the process, how narrow and sharply focused should the effort be? The effective schools research provides one framework around which to structure the content of a rural school staff development/school improvement effort. As indicated earlier, some components of this research may be more applicable to small rural school improvement than others. Furthermore, the most critical school improvement needs may lie outside those areas included in the effective schools research. For instance, the Project might have made more of a difference in the quality of education available if it had focused more specifically on curriculum development during the four years rather than the time efficiency issues. Given the parameters of the RFP and the subsequent contract, this was not possible, although as is clear from the report, the content of the staff development sessions covered a much broader range of topics than those related specifically to increasing engagement rates.

The question of how sharply focused an effort should be must resolve the tension which exists between the practitioner whose primary concern is getting some practical assistance in the classroom and the researchers that want to see some significant differences in the data. This Project attempted to walk a fine line between the two extremes and did not satisfy either of the two parties completely.

Recommendation: In determining the focus of staff development/school improvements efforts, the effective schools research should be viewed as only one of a number of bench marks to be used. A clear agreement is needed up-front concerning the primary objectives of the program so that expectations of those participating are met.

The Delivery. Creating an ongoing collaborative arrangement between the two neighboring rural school districts and outside technical assistant agencies, e.g. a university and/or a regional laboratory, for staff development, worked well and was cost effective. The isolation which is inherent in rural districts was addressed in a number of ways. Teachers, who tended to be "one of a kind" in terms of their teaching assignments, had a continuing forum to exchange ideas with their peers. The consultants provided by the University and the Lab continued to bring new ideas to the participants. The long term arrangement brought with it the time to build the level of trust among the teachers, administrators and the consultants necessary to bring about substantive change in the school program.

Both the data and the observations of the consultants suggests that the biggest impact from the intervention came during the first year of the program and then leveled off. Schools considering a similar effort may wish to stage the intervention so that the biggest investment of time and resources comes during the first year followed by less intense, but ongoing support for the changes. One could at least speculate that with such arrangements, the overall impact might be about the same with a lesser expenditure of time and resources.

The availability of the teachers for a full day of staff development, provided by the four-day school week, made the relative long trip to the sites, by the consultants, worthwhile. Using part-time consultants rather than full-time staff kept the project costs within reason for small districts.

THE RESEARCH DESIGN/RECOMMENDATIONS REGARDING DATA COLLECTION PROCEDURES

Part of the training was based on the assumption that feedback is important if a person is to change. This feedback should include quantitative data such as information about time-on-task, behavior checklists, and success rate. However, these data cannot be viewed as the only legitimate measures of change. Also, if they are to use the data as feedback, teachers must find the data credible. Several comments made by the teachers can help improve the believeability of the data. 1) The person doing the data collection must be perceived as competent, i.e. well-trained in the data collection process and understanding the teacher's intentions as well as accurately recording the teacher's behavior. 2) The data collector should be the same person, if possible, each time data is collected. 3) Every effort should be made to insure that the data are collected on what the teachers view as typical days. 4) Short periods of observations over several days are preferable to long periods on one day. One way to improve the credibility of the data collection is to either train teachers to collect data in their own classrooms or have their partners in the peer observation process collect the data.

A second recommendation concerns the instruments used to collect the data. Untried procedures or poorly written questionnaires will more than likely produce ambiguous results. Instruments which are created or selected should have reliability and validity data collected or already available. Often instruments are not sensitive enough to detect change which does occur, thus masking treatment effects. Also, the instruments used and their administration should remain consistent over time to produce comparable data.

A final recommendation is that at least minimum anticipated behavior change in both teachers and students be specified before data collection occurs. Instruments should be selected or developed to measure all important outcomes. Baseline data should be collected for all important outcomes.

TECHNICAL APPENDIX A

School Climate Questionnaire

1984-85 Engagement Rate Collection Instrument

Original Engagement Rate Collection Instrument

Discipline Checklist

Instructional Techniques Checklist

Open-Ended Questionnaire

SCHOOL CLIMATE QUESTIONNAIRE

Number of questions:

Developed by project trainers

No known validity or reliability data

Quality: Many of the questions are poorly worded or use double negatives which make the questions difficult to answer and the meaning of the responses unclear

Westcliffe

Listed below are the specific characteristics/behaviors identified for each of the five school climate areas. Please rate your school (H=high, M=medium, and L=low) on each characteristic/behavior.

STUDENT/FACULTY MOTIVATION

H	M	L		
		✓	1.	Special means exist to recognize and reward students who have worked hard, made progress, or accomplished something special.
	✓		2.	Instructional techniques that are highly motivating are used such as "Team Tournament Games" or "Concept attainment".
✓			3.	Teachers are able and willing to help each other with motivational ideas; staff meetings or other communications arrangements are set up to permit this exchange to go on.
✓			4	The building has a low absentee rate compared to other schools in the district or state.
	✓		5.	There are no broken windows or other evidence of vandalism.
	✓		6.	There is an absence of grafitti in the restrooms.
	✓		7.	The playground equipment is in good repair and is all operable.
✓			8.	There is an absence of litter in the building and on the playground.
	✓		9.	The furnishings are kept in good repair.
			10.	The building is well-lighted and clean.
✓			11.	Teachers voluntarily participate in student activities, such as: playing students in a game of softball, operating booths at a school carnival, helping students prepare food for the school picnic, parties, etc.
✓			12.	Teachers make an effort to get to know students and their parents on a personal basis.
	✓		13.	Teachers will extend their day when requested to do so by students.
		✓	14.	Teachers provide specific time during the day to meet with individual students who need and/or want help with academic or personal problems.
	✓		15.	Teachers encourage students to discuss their problems.

EXPECTATIONS

H	M	L		
✓			1.	No one's "written off"
			2.	Some students aren't given easier work.
			3.	The same standards are held up to everyone—with consistency.

H	M	L		
✓			4.	Grouping arrangements are not used to signal to some students they aren't expected to do as well as others.
✓			5.	Student academic work is displayed on bulletin boards, in halls and in classrooms, etc.
		✓	6.	Student academic projects are featured in the school newspaper/newsletter.
		✓	7.	Long term grouping is not done on an ability basis.
	✓		8.	Teachers responses and support to students they perceive as low achievers is no different than their response to perceived high achievers.
✓			9.	Teachers give praise that is realistic and specific with respect to the performance.
✓			10.	Teachers give immediate praise for the academic performance.
	✓		11.	Rewards for academic performance allows many students to receive recognition.
	✓		12.	Procedures exist for immediate (daily or weekly) recognition of students achievement.

Low achieving students are not:

H	M	L		
	✓		13.	Reprimanded more.
		✓	14.	Given easier questions to answer.
✓			15.	Cut off sooner than high achievers.
✓			16.	Given less academic feedback.
✓			17.	Praised either less or more than others.
✓			18.	Treated impolitely.
	✓		19.	Grouped together. [redacted]

TEACHER PROFESSIONALISM

H	M	L		
✓			1.	Teachers are willing to allow other teachers and/or parents to visit their classrooms.
✓			2.	Teachers sometimes invite the principal or other administrators to visit their classrooms.
✓			3.	Teachers are willing to share successful ideas and strategies with each other.
✓			4.	Teachers help each other.
✓			5.	Teachers continue to attend classes/programs for individual growth.
✓			6.	Teachers demonstrate professional integrity using sick leave, professional days, etc.
	✓		7.	They cooperate in required meetings (PTA, curriculum, etc.)
✓			8.	They demonstrate a positive attitude toward their job.
✓			9.	Teachers share their suggestions for improvements openly.
✓			10.	Faculty members personally welcome each new teacher.
	✓		11.	Grade level faculty members offer extra assistance.

	✓		12.	Faculty members invite new teachers to out-of-building luncheons.
	✓		13.	Faculty members make sure new teachers are aware of the Parent Teacher conference routine.
✓			14.	Compliments are freely given.
✓			15.	Faculty members enjoy each others company.
✓			16.	Faculty members acknowledge and are proud of the accomplishments of other faculty.
✓			17.	Faculty members are aware of each other's interests and special abilities.
	✓		18.	Faculty members seek solutions to differences in a positive, open manner.
	✓		19.	Faculty members feel teaching is a team effort with all contributing their best.
			20.	Faculty members share ideas and offer assistance to others.

BUILDING SUPPORT TO TEACHERS

H	M	L		
	✓		1.	Teachers participate on committees for curriculum study, and materials selection, etc.
	✓		2.	Teachers contribute suggestions and time to various school improvement projects.
	✓		3.	Teachers share responsibility for outcomes of school projects.
	✓		4.	Cross-grade coordination of instruction occurs in the school.
	✓		5.	Ample building-level emphasis on academic achievement is present.
✓			6.	Workable arrangements have been made for handling discipline activities that require the involvement of the principal and other staff.
	✓		7.	Praise and "strokes" are regularly provided to teachers.
✓			8.	Personal concerns of teachers are listened to by the principal and other teachers.
✓			9.	Teachers have a say-so in building wide rules and activities that affect them.
✓			10.	Staff time is available to share good ideas that other teachers use and to help teachers solve classroom problems.
	✓		11.	A few, building-wide rules or codes of conduct have been developed and everyone supports them and models them.
✓			12.	Workable job descriptions exist and/or the principal is willing to discuss and clarify job duties and tasks.
✓			13.	The principal makes him/her self available to discuss teacher's problems.
✓			14.	The principal is generally aware of problems that exist within the building.

			15.	The principal is effective in relaying teacher concerns to the district office and vice versa.
			16.	Disagreements are openly aired and resolved.
			17.	There is a useable curriculum quide to direct instruction; the guide is used.
			18.	Teachers have an opportunity to learn what other teachers teach.
			19.	There have been meetings (or other procedures) for securing agreement about curriculum and goals between the teachers in the building and the teachers in the "feeder schools" they are connected to.
	✓		20.	Teachers who teach the same programs (grade level) teach to the same objectives.

PARENTAL INVOLVEMENT

H	M	L		
		✓	1.	Parents are given regular (e.g., weekly) reports on student progress and/or notification when students do something special.
	✓		2.	Parents/teacher conferences are held well in advance of a decision to give a failing grade or retain a student in a grade.
	✓		3.	Suggestions are made to parents about what they can do to be involved in their student's learning.
✓			4.	Parents know what the discipline codes of the school are.
	✓		5.	Parents are contacted when discipline problems emerge.
	✓		6.	Parents know what is academically expected of their child.

1984-85 ENGAGEMENT RATE COLLECTION INSTRUMENT

Developed by project staff

Index of concordance = .905
(2 observers, 3 observations, 14 students)

No known validity data

There was some question about the observers' ability to make the judgments required in distinguishing between instructional activities and instructional management activities

Original Engagement Rate Collection Instrument

ENGAGEMENT RATE DURING INSTRUCTION

Teacher____________________
Date____________________
Time Sweep Began____________
No. of Students Observed________
No. of Students Absent________
Total No. of Students Engaged at End of Sweep________
Time Sweep Ended____________

	Student #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTALS
	Engaged																
	Not Engaged																
	Knows the answer																
	Not sure of answer																
	Doesn't know answer																
Student is:	Working w/teacher																
	Working independently																
Student is engaged at:	listening																
	reading aloud																
	reading silently																
	writing																
	grading papers																
	answering question orally																
	asking question																
	OK'd free time																
	OK'd other assignment																
	using manipulatives																
	working w/partner																
	other																
Student is not engaged, but is:	getting materials																
	waiting																
	out of seat																
	socializing																
	no apparent activity																
	being disruptive																
	doodling																
	other																
Teacher is:	Presenting lesson to all																
	working with small group																
	questioning all																
	eliciting correct answer from one																
	checking for understanding from all																
	monitoring seatwork																
	grading papers																
	waiting																
	disciplining a student																
	talking to a visitor																
	other																
Teacher is:	moving around classroom																
	standing or sitting in one place																
	seated at desk																
	other																

Engagement Rates During Instructional Management or Interruptions

Engagement rates during INSTRUCTIONAL MANAGEMENT OR INTERRUPTIONS

Teacher____________________________

Date_______________________________

Time Sweep Began___________________

No. of Students Observed_____________

No. of Students Absent_______________

Total No. of Students Engaged at End of Sweep____________________

Time Sweep Ended___________________

	Student #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTALS
	Engaged																
	Not Engaged																
Student is engaged in:	getting materials																
	listening																
	reading																
	writing																
	asking questions																
	answering questions																
	OK'd free time																
	other																
Student is not engaged, but is:	out of seat																
	waiting																
	socializing																
	no apparent activity																
	being disruptive																
	doodling																
	other																
Teacher is:	organizing or collecting materials for presenting lesson																
	distributing materials to students																
	giving directions for completing assignment																
	introducing purpose for lesson																
	closing activity for lesson																
	waiting																
	disciplining a student																
	helping one student while others wait																
	reading a message																
	taking role, lunch count, or other secretarial duties																
	talking to a visitor																
	other																
Teacher is:	walking around room																
	standing in one place																
	sitting at desk																
	other																

Non-instructional Activities

Non-instructional Activities

Teacher______________________________

Date_________________________________

								IN-CLASS								
			Out of Class					Instructional Management			Behavioral Management			Non-Instructional Activities		
Time Began	Time Ended	Duration	Lavatory Break	Lunch	Recess	Break between classes	Other	Beginning Managerial Activities	Teacher giving or explaining assignment	Ending Managerial Activities	Transition Time	Teacher Disciplining	Teacher working with two-others wait	Social Activities	Outside Interruptions	Other

ENGAGEMENT RATES

Teacher ____________________
Date ____________________
Time Sweep Began ________________
No. of Students Observed ____________
No. of Students Absent ____________
Total No. of Students Engaged At End Of Sweep ________________
Time Sweep Ended ________________

Student #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTALS
Engaged																
Not Engaged																
Reading																
Listening																
Writing																
Drawing																
Cut & Paste																
Singing																
P.E. Activities/Creative Movement																
Grading Papers																
Gathering Work Materials (scissors, glue, etc.)																
OK'd Free Time																
Discussing																
Responding to Questions																
Taking Test																
Other:																
Reading																
Listening																
Writing																
Drawing																
Social Interaction																
Wandering																
No apparent activity																
Waiting for Teachers help																
Playing around																
Other:																
Whole class instruction																
Small group instruction																
One small group other independent																
All working independently																
Other:																
Oral instruction																
Monitoring																
Asking Questions																
Listening																
Grading Papers																
Working with one small group																
Other:																

Non-Academic Activities

NONACADEMIC ACTIVITIES

Teacher________ ____________________

Date__________________________

Time Began	Time Ended	Duration	Out of Class					In Class								
			Lav Break	Lunch	Recess	Break between classes	Other	Beginning Managerial Activity	Transition time	Teacher giving or explaining assignment	Teacher disciplining	Teacher working with 2 students--others wait	Ending managerial activities	Social Activities	Outside Interruptions	Other
2:00	[illegible]	-											✓			
[illegible]	[illegible]	[illegible]									✓					
	[illegible]															
2:00	[illegible]					✓										
[illegible]	[illegible]15	15		✓	[illegible]											
3:50	[illegible]												✓			
	[illegible] 00								✓							

Discipline Checklist

DISCIPLINE

SECTION III

a) TEACHER ______________________

b) DATE ______________________

c) SCHOOL ______________________

DIRECTIONS: Put a check after each behavior each time it occurs.

	CHECK MARKS	TOTALS
1. Teacher leaves classroom--students are present	✓	
2. Teacher stops an inappropriate behavior at once	✓	
3. Teacher waits to stop an inappropriate behavior, or ignores it	✓	
4. Teacher rewards a good behavior	✓	
5. Teacher ignores a good behavior	✓	
6. Teacher purposely moves toward and stops near a behavior problem	✓✓	
7. Teacher is impolite to students		N/C
8. Teacher touches a student as form of positive reinforcement		N/C
9. Teacher uses direct/simple reprimand	✓✓	
10. Teacher uses indirect form of reprimand		N/C

Instructional Techniques Checklist

DIRECTIONS: Put a check mark next to each behavior each time it occurs.

a) Clarity of Goals and Assignments

The Teacher:	Check Marks
1) spells out skills/knowledge to be acquired.	
2) identifies resource material.	
3) identifies major steps in tasks.	
4) lists checkpoints to measure progress.	
5) establishes deadlines for completion of assignments.	
6) points out next activity to be done.	
7) writes directions on board.	
8) allows time for practice.	
9) gives clear and specific feedback about questions of students and responses.	
10) praises all students who deserve it.	
11) gives directions often and spends time discussing the structure of the lesson.	
12) gives explanation in response to student needs.	
13) has a regular routine at the beginning of each class.	

b) Classroom/School Rules

The Teacher:	
1) has a workable and consistent routine and policy for enforcement of school-wide policies or rules.	

The Teacher:	Check Marks
2) monitors students to see if they understand their responsibilities.	
3) holds the students accountable for keeping rules.	
4) makes sure the consequences for good and bad behavior are clearly understood and consistently applied.	
5) uses oral repirmands and nonverbal cues.	
6) has a visual list of rules.	
7) is involved with students in a personable and friendly manner.	
8) deals with present behaviors only.	
9) accepts no excuses from students given for violation of a rule.	
10) avoids use of "language of unacceptance."	

c) Motivation

The Teacher:	Check Marks
1) has special means to recognize and reward students who have worked hard and made progress.	
2) uses instructional techniques that are highly motivating (e.g., "Team Games")	
3) is willing to work with other teachers sharing motivational ideas.	
4) shows genuine zest and enthusium.	
5) identifies the activities that will be fun for students.	
6) identifies the activities that will be of particular intellectual challenge for students.	
7) provides learning activities of variety and wide range of intellectual challenge.	

OPEN-ENDED QUESTIONNAIRE

TEACHER IMPRESSIONS OF THE COTOPAXI/WESTCLIFFE FOLLOW THROUGH PROJECT

Please answer the following questions in as much depth as possible. Use additional paper if necessary. Return this questionaire to either Mr. Dick Wilson or Mr. Larry Coleman on or before March 14, 1985.

1. How long have you been participating in the project?

2. Indicate the grade level taught.

3. Please describe your general impressions of the project.

4. Do you feel as though the data collection process accurately reflects your classroom(s) behavior? Why or why not?

5. Do you think these data should have been obtained differently? How?

6. Do you feel as though the inservice training was valuable? Why or why not?

7. What did you learn from the inservices? Please be specific.

8. Describe your classroom now as opposed to 1981-82. (If this is your first year in the project, indicate any changes in your classroom this year.)

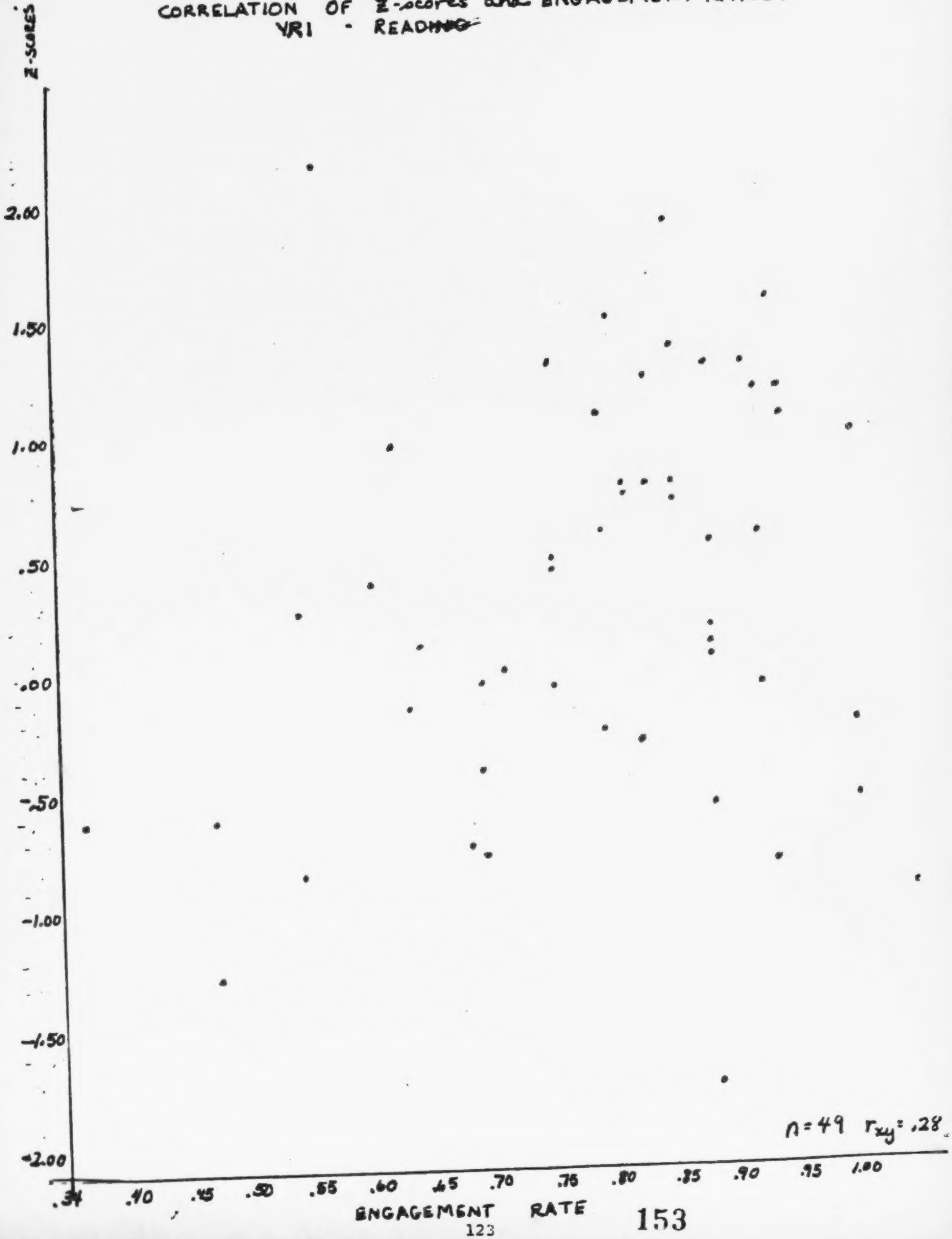
9. Describe any new teaching strategies and/or behaviors you have tried or are now implementing as a direct result of the project.

10. What do you feel was the best thing about the project?

11. What do you feel was the worst thing about the project?

APPENDIX B

FIGURE IV. 19
CORRELATION OF Z-scores and ENGAGEMENT RATES.
YR1 - READ~~ING~~



$n = 49$ $r_{xy} = .28$

FIGURE IV.20
CORRELATION OF Z-scores AND ENGAGEMENT RATE
YR2 - READING

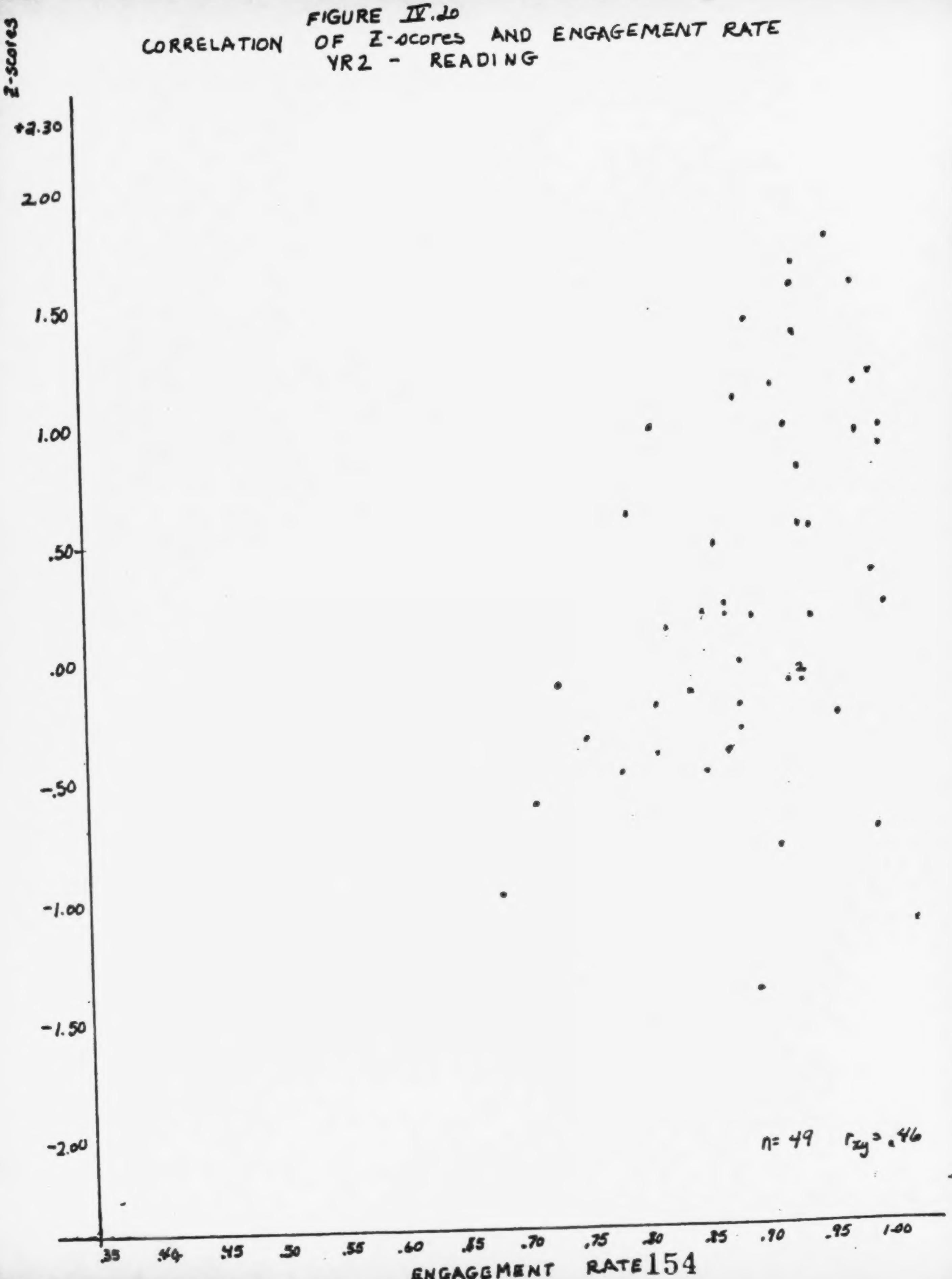


FIGURE IV.21
CORRELATION OF Y1 + Y2 Z-SCORES IN READING

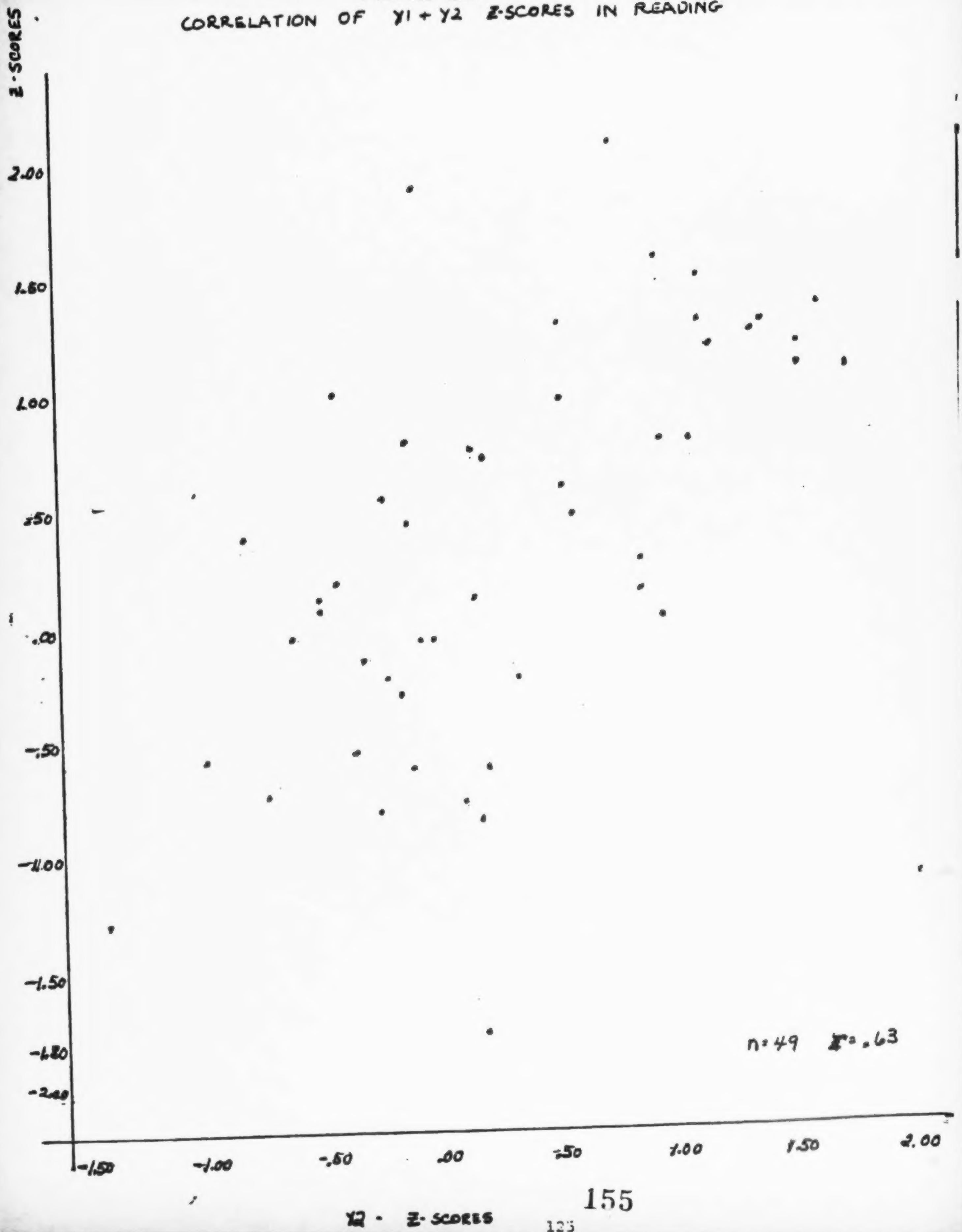


FIGURE IV.22
CORRELATION OF Z-SCORE AND ENGAGEMENT RATE
YR3 - READING

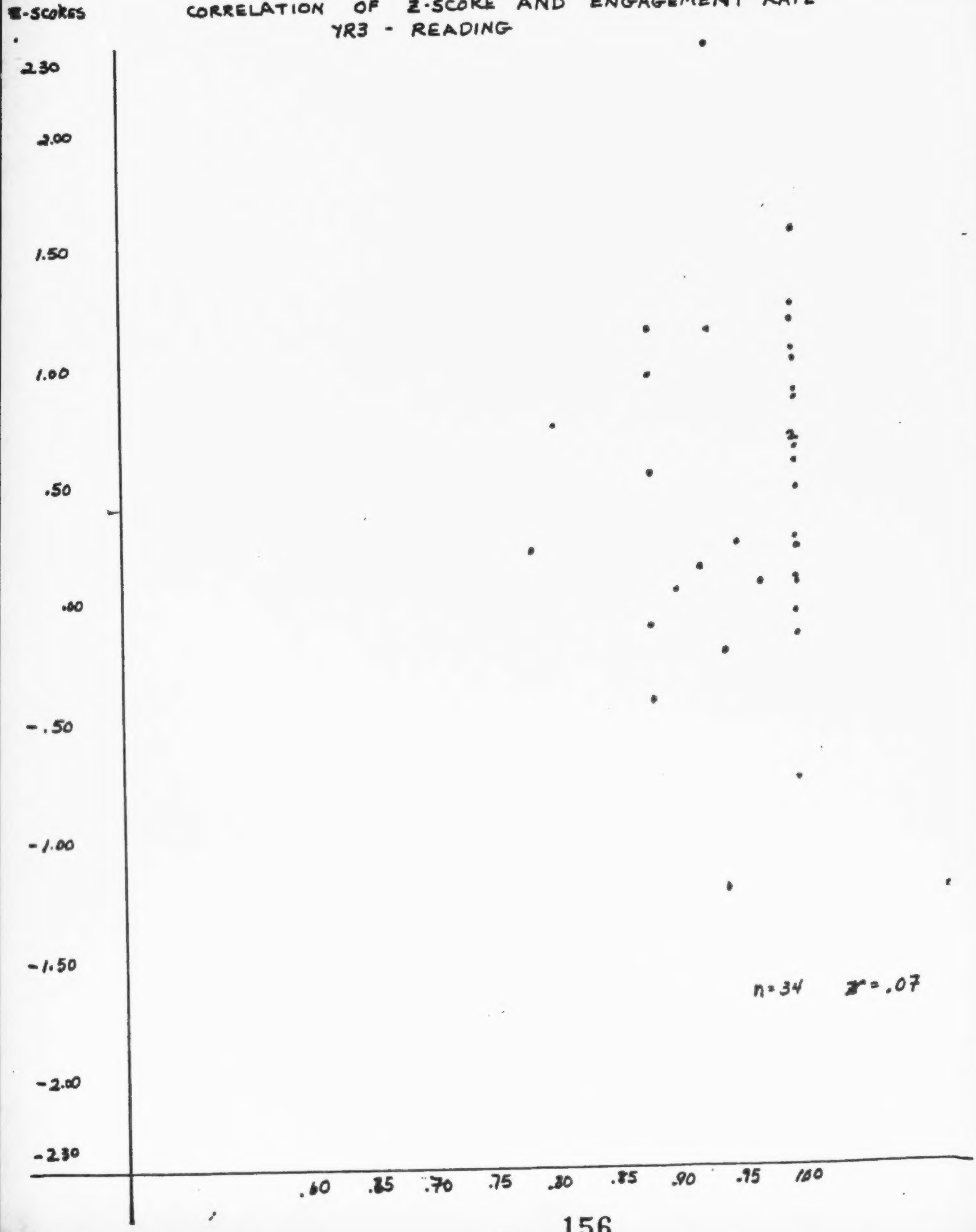


FIGURE IV.23

CORRELATION OF YR2 + YR3 Z-SCORES IN READING

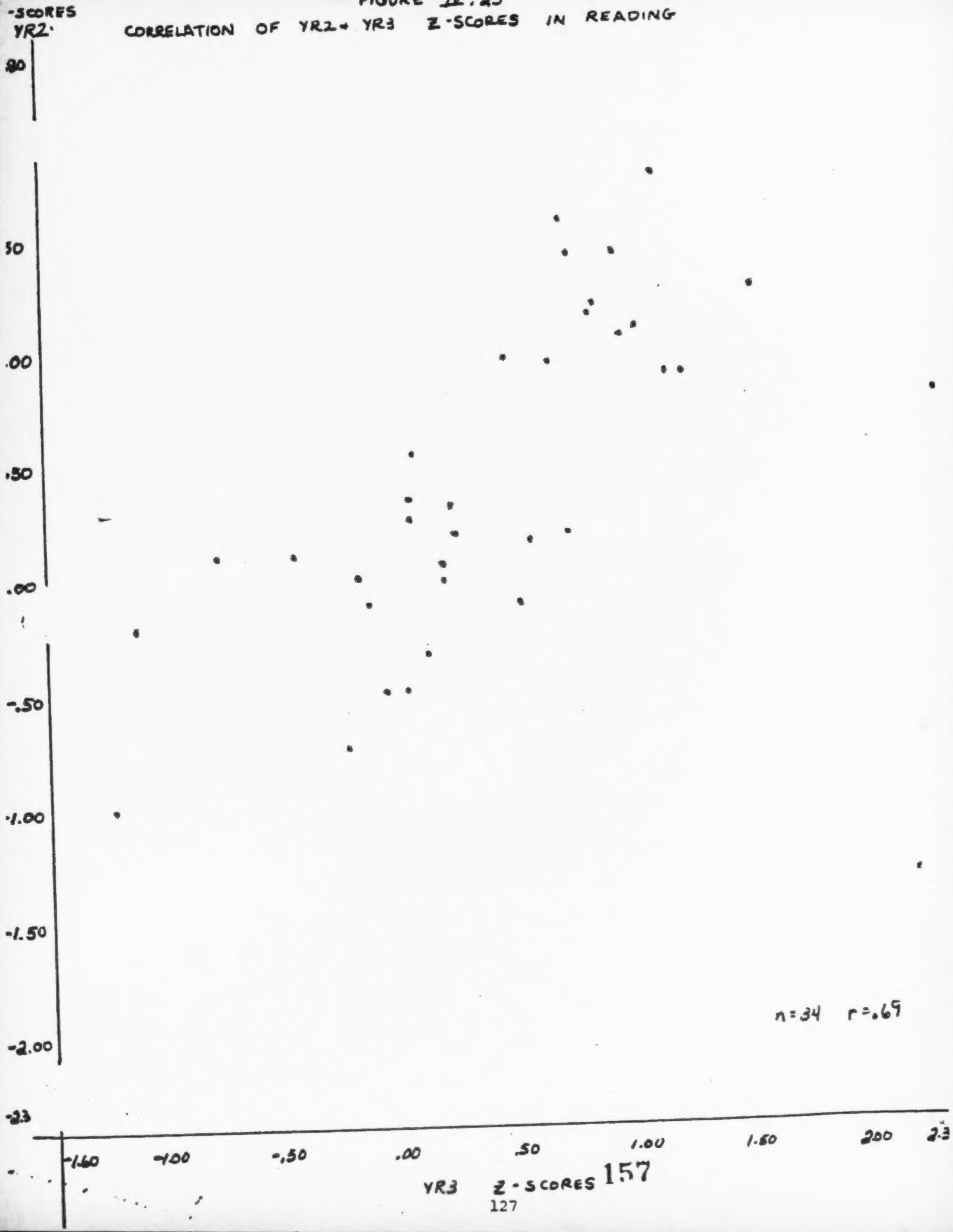


FIGURE IV.24

CORRELATION OF YRI Z-SCORES AND ENGAGEMENT RATE
ARITHMETIC

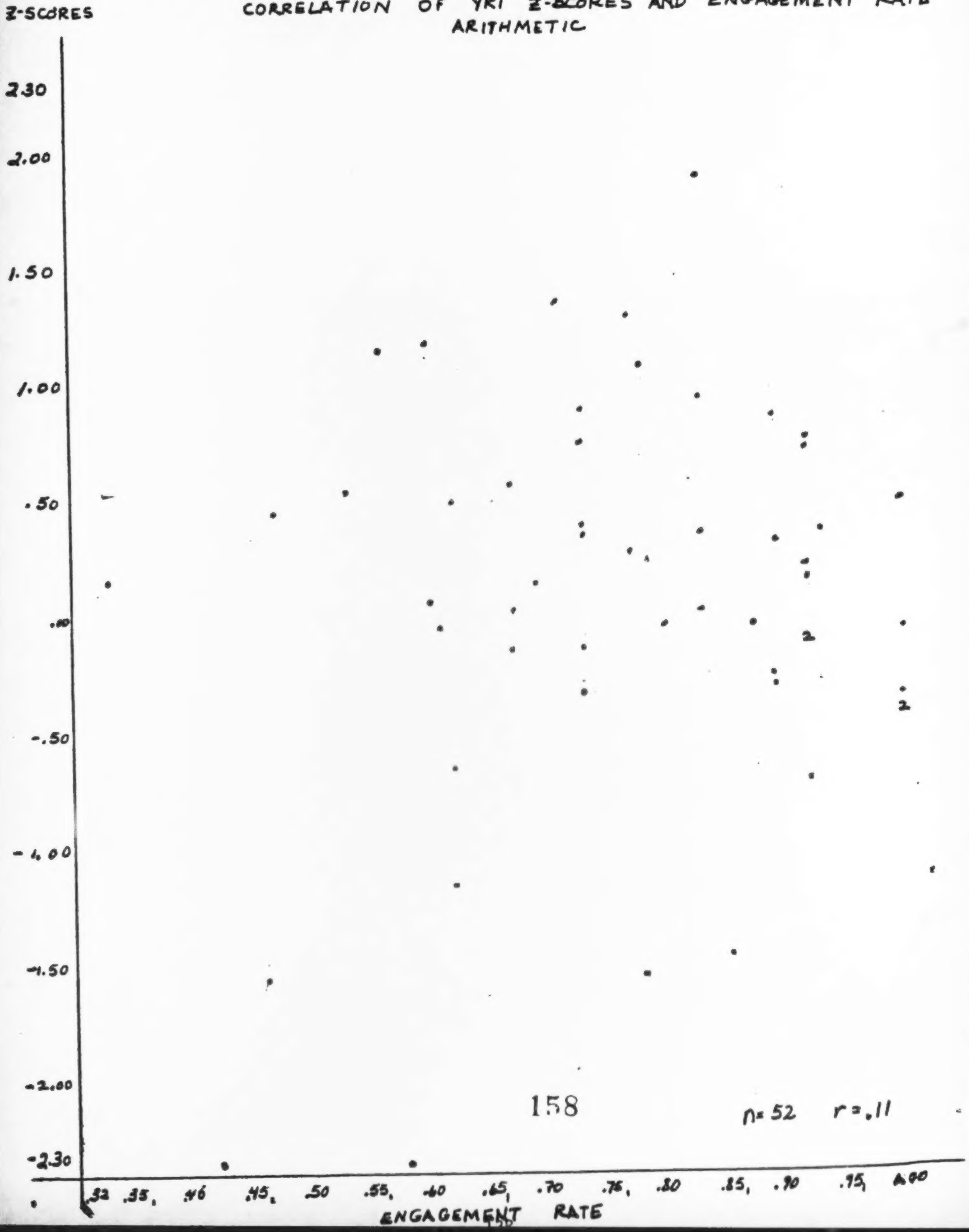


FIGURE IV.25

CORRELATION OF YR2 Z-SCORES AND ENGAGEMENT RATE

ARITHMETIC

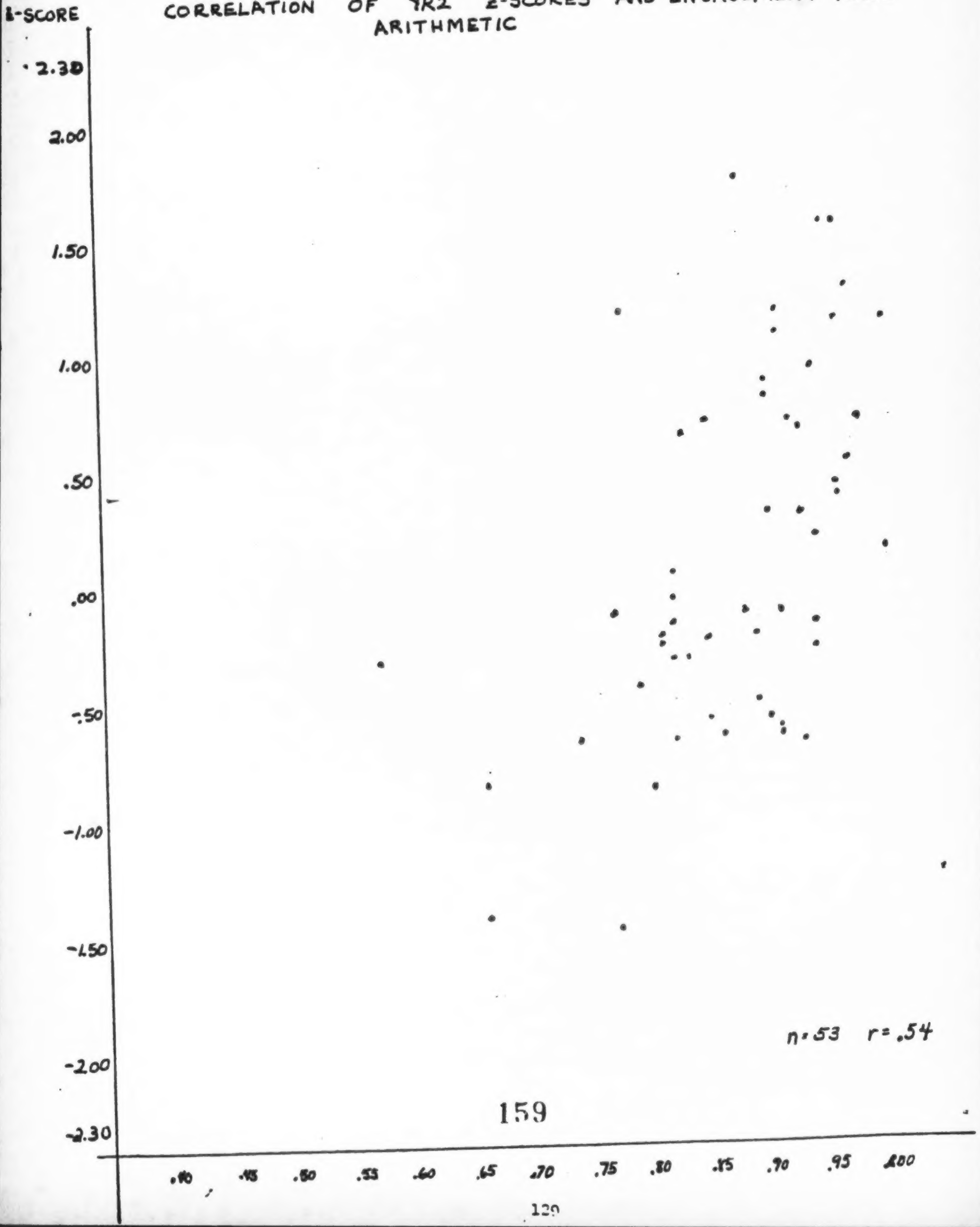
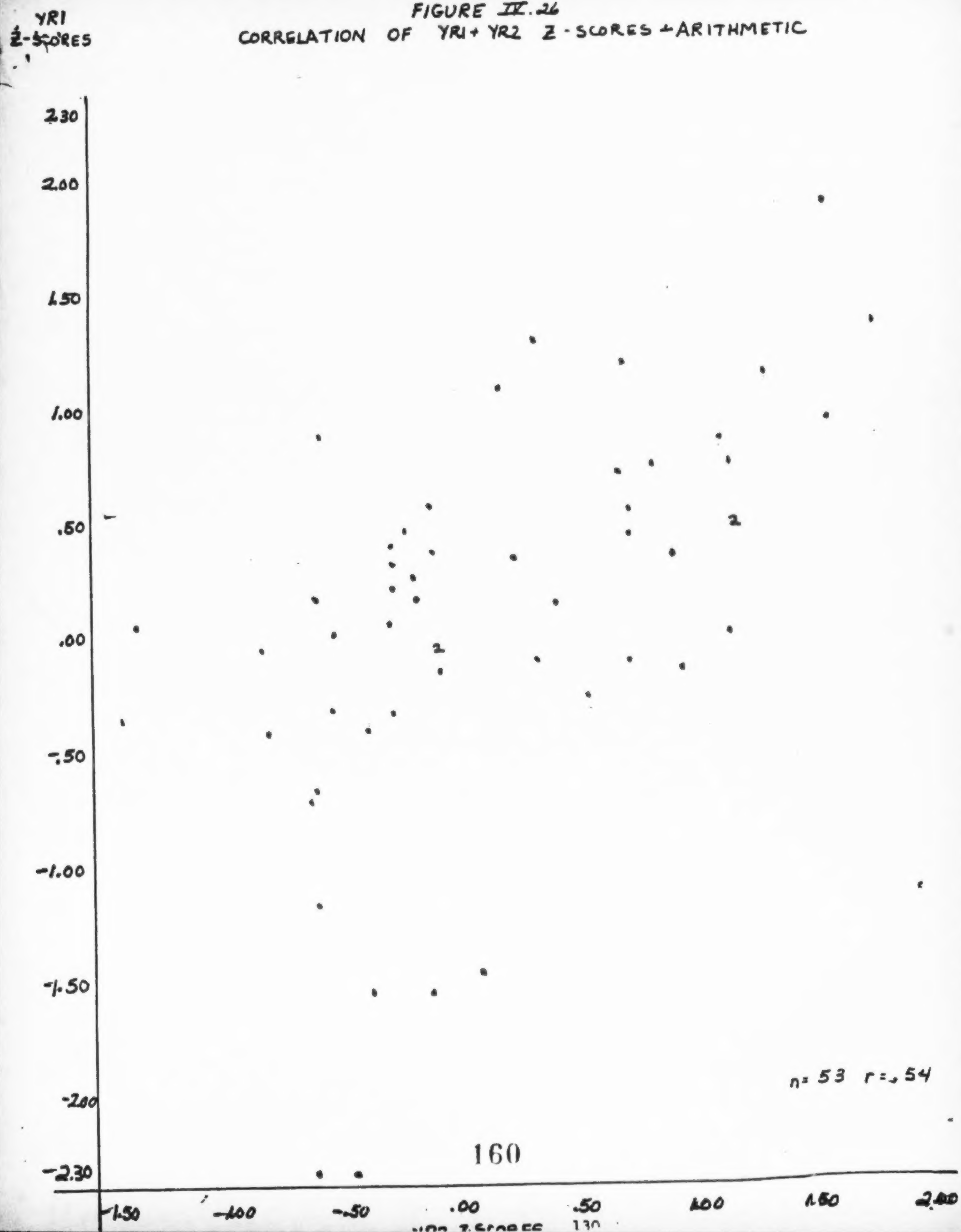


FIGURE IV.26

CORRELATION OF YR1 + YR2 Z-SCORES - ARITHMETIC



n = 53 r = .54